Implementation of Biodiversity Measures under the Forest Practices Code

Implications for the Transition to the Forest and Range Practices Act

Special Report

FPB/SR/17

March 2004

Executive Summary

This special report provides the public with a picture of the British Columbia government's progress in planning and implementation for biodiversity in provincial forests since the Forest Practices Code (the Code) came into effect in 1995.

Biological diversity or 'biodiversity' is a concept that has become a key issue in the management of British Columbia's forests in the last two decades. Internationally, Canada has made commitments to conserve biodiversity under the United Nations Convention on Biological Diversity. Conservation of biodiversity on British Columbia's forested landbase occurs at several levels. At the highest level, the Crown forest landbase is divided into protected areas, inoperable forest, areas where timber harvesting is constrained, such as riparian reserves, and the timber harvesting landbase. Protected areas alone are not enough to conserve biodiversity across the landscape, so the Forest Practices Code applied measures to conserve biodiversity to the remaining forest landbase.

The preamble to the Code recognized the importance of biodiversity by stating that British Columbians desire sustainable use of the forests and that sustainable use includes the conservation of biological diversity. However, the Code itself created very limited legal requirements to protect biodiversity and much of the effort to date has been based on policy and not law. That policy is described in the *Identified Wildlife Management Strategy*, the *Biodiversity Guidebook* and the *Landscape Unit Planning Guide*. Together, these documents set out a strategy to address biodiversity. These documents were used as a baseline for examining the implementation of a biodiversity strategy under the Code. This report assesses progress in implementing the strategy, but does not examine effectiveness of the strategy in maintaining biodiversity.

Information was obtained by a questionnaire and interviews with key government staff across the province. The results were assessed by forest district, although the Ministry of Forests shares responsibility for implementation with the Ministries of Sustainable Resource Management and Water, Land and Air Protection. As government has the lead responsibility in implementing biodiversity conservation measures, forest licensees were not interviewed and the report does not include individual efforts some licensees are taking in areas where they conduct operations. The report also focuses on forestry activities and does not address range activities.

Findings

The results show that the level of implementation of the biodiversity strategy varies significantly across the province. Implementation level was measured using 10 criteria– based on the key components of the biodiversity strategy. District scores ranged from 4.0 to 9.5, out of the maximum score of 10.0. The highest levels of overall implementation were found in the Northern Interior and Cariboo regions. The lowest levels of overall implementation were found

in the Coast and Okanagan regions. The overall provincial rating was 7.0. The results are discussed in more detail in section 3.0 of the report.

Overall provincial success in implementing the individual components of the strategy varied considerably as well. The components that establish the administrative framework for the biodiversity strategy—defining landscape unit boundaries and determining biodiversity emphasis areas—were completed in all districts.

The stand level components—establishment of riparian reserves and wildlife tree patches—were also fully implemented in all districts. These two components are required by legislation. They are also the more traditional forestry-related activities that most forest managers are familiar with.

Relatively poor implementation has occurred for landscape level components of the strategy—including monitoring of seral stages (including mature and old), achieving old growth targets in landscape units, spatially establishing old-growth management areas (OGMAs), monitoring patch sizes, and managing for connectivity. These components are established by policy and are not required by legislation. They are also the newest and most unfamiliar approaches to traditional forest management. These components were implemented in less than half of the districts.

The original biodiversity strategy was developed fairly quickly in the mid-nineties, and with less scientific information than is available now. There are also differing interpretations of the intent of, and the approaches to implementing, components of the strategy, particularly the landscape level components. In addition, for some components, it is not clear which agency has responsibility for implementation. When it comes to monitoring implementation of the strategy, a coordinated provincial approach is lacking.

Implications for the Forest and Range Practices Act

To date, the biodiversity strategy has been implemented under the umbrella of the Forest Practices Code and its guidebooks. The new *Forest and Range Practices Act* is now coming into effect and there are a number of differences in how biodiversity is addressed in the new legislation.

The new Act sets a broad objective for landscape level biodiversity– to carry out forest harvesting in a manner that emulates natural disturbance of the forest (through fire, insects, etc.). The Act and regulations also set specific standards for wildlife trees and coarse woody debris, and maintain the standards for reserves next to streams and watercourses. However, a number of components of the biodiversity strategy receive no mention in the new Act and regulations.

Biodiversity Measures under the Forest Practices Code vs. FRPA

Biodiversity measure	Under FPC	Under FRPA	Comments
Landscape unit boundaries	In guidebooks and the Act.	Not mentioned. But FSPs must be consistent with set objectives.	Intent is to complete establishment under the Code Act before 2005.
Biodiversity emphasis options	In guidebooks.	Not mentioned. But FSPs must be consistent with set objectives.	Intent is to complete establishment under the Code Act before 2005.
Seral stage objectives	In guidebooks.	Not mentioned	
Old growth management areas	In guidebooks and regulation.	Not mentioned. But FSPs must be consistent with set objectives.	Intent is to complete objectives under the Code Act before 2005.
Patch size	In guidebooks.	Not mentioned*	
Wildlife trees	In guidebooks and regulation.	Yes - new required standard	
Connectivity	In guidebooks.	Not mentioned	
Riparian management	In guidebooks and regulation.	Yes.	
Coarse woody debris	In guidebooks and regulation but no measurable standard.	Yes - with required standard**	
Ungulate winter ranges	In regulation.	Yes - new constraints***	
Wildlife habitat areas	In guidebook and regulation.	Yes – new constraints***	

**There are default maximum cutblock sizes under FRPA but these do not address the intent of patch size guidelines for biodiversity.*

***The default standard for retaining coarse woody debris requires few pieces that are very small and doesn't address the need for retaining larger pieces that will last over time.*

****Under FRPA the authority to establish wildlife habitat areas and ungulate winter ranges is given solely to the Minister of WLAP, however this comes with a new constraint in addition to the existing one percent policy cap for wildlife habitat areas. The minister may not establish an ungulate winter range or a wildlife habitat area if it is inconsistent with the objectives set by government for that area.*

The strategy has only been partially implemented and it is not clear if government intends for implementation of the strategy to continue. As the province makes the transition to the new Act, a number of issues will need to be addressed. In particular, government needs to provide clear provincial direction on what biodiversity measures will have to be addressed and what the expected results are.

The new Act also moves the Board further into the role of evaluating achievement of results on the ground. This report does not look at effectiveness of biodiversity measures at achieving results on the ground. However, we expect to begin making such evaluations in the coming years. In order to do so, we will need indicators that tell us if we are conserving biodiversity at

the stand and landscape levels. In addition, monitoring of the implementation of various biodiversity measures across the province will be necessary to enable assessments of effectiveness.

The Board makes the following recommendations:

1. The Ministry of Forests and the Ministry of Water, Land and Air Protection should give clear direction on what the overall strategy for biodiversity is now, and how it applies under the *Forest and Range Practices Act*, making clear where changes have been made to the strategy. Specifically:

    - The Ministry of Water, Land and Air Protection should coordinate a review of the biodiversity strategy, including an evaluation of the science behind it, and revise the strategy where necessary.

    - The Ministry of Forests and the Ministry of Water, Land and Air Protection should ensure that there are default measurable results for stand and landscape level biodiversity in the Act and regulations.

2. The Ministry of Forests and the Ministry of Water, Land and Air Protection should clarify how proposals for wildlife habitat areas will be considered and prioritized after the one percent policy cap has been reached.

3. The Ministry of Forests and the Ministry of Water, Land and Air Protection should work together to develop indicators to enable assessment of the effectiveness of measures to conserve biodiversity.

4. The Ministry of Sustainable Resource Management should determine the frequency and nature of monitoring required for biodiversity measures, and ensure that monitoring occurs consistently across the province. The ministry should also ensure that there is a program in place to store biodiversity information digitally so that it is readily accessible for managers and auditors.

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1.0 Introduction

Biological diversity or 'biodiversity' is a concept that has become a key issue in the management of British Columbia's forests in the last two decades. Internationally, Canada has made commitments to conserve biodiversity under the United Nations Convention on Biological Diversity. Management guidelines for conserving biodiversity were an essential component as the Forest Practices Code developed. The preamble to the Code recognized the importance of biodiversity by stating that British Columbians desire sustainable use of the forests and that sustainable use includes the conservation of biological diversity. The general strategy for conserving biodiversity is described in the *Identified Wildlife Management Strategy*, the *Biodiversity Guidebook* and the *Landscape Unit Planning Guide*.

The Board produced this special report to provide the public with a picture of what has been happening with government planning and implementation for biodiversity in provincial forests since the Forest Practices Code came into effect in 1995, including activities up to early 2003. The report focuses on forestry activities and doesn't include range activities. It aims to document the application of the key components of the biodiversity strategy in each forest district and the overall implementation across the province. It does not assess the effectiveness of the strategy at maintaining biodiversity.

1.1 Components of the Biodiversity Strategy

The biodiversity strategy under the Code was based on a coarse filter and fine filter approach. The coarse filter involves managing habitat for multiple species at both the landscape and stand level. The fine filter is implemented for a single species or group of species, whose habitat requirements are not captured by the coarse filter. The intent of the strategy is to retain essential habitat components within the timber harvesting landbase to complement the protected area network.

Table 1: Biodiversity Strategy Components

Coarse Filter Elements	Fine Filter Elements
Old growth management areas	Wildlife habitat areas
Seral stage	Ungulate winter ranges
Patch size	Resource features
Connectivity corridors	
Riparian areas	
Wildlife tree patches	
Coarse woody debris	

The coarse filter elements are identified in the *Biodiversity Guidebook*, the *Riparian Management Area Guidebook* and the *Landscape Unit Planning Guide*. At the landscape level, coarse filter management involves maintaining areas of old growth, identifying connectivity corridors and managing the amounts of young, mature and old-aged forest. It also involves managing the sizes of patches created by timber harvesting so that the mosaic of natural and human-caused patches is consistent with natural disturbance patterns, both spatially and over time. At the stand level, management is for retention of wildlife tree patches and supply of coarse woody debris.

The strategy is based upon the concept of natural disturbance types (NDT). These are areas where disturbance events, such as fire or insect infestations, are similar in terms of the frequency of disturbance, the area disturbed and the level of damage to a forest stand. The recommended strategy varies among NDTs. For example, an area with a history of frequent light-intensity fires would likely have greater levels of old forest as a recommended target than an area where fires were less frequent but tended to destroy a stand.

Many aspects of the strategy were intended to be applied within landscape units. These are planning areas covering one to several watersheds. Landscape units are assigned a biodiversity emphasis option (BEO): higher biodiversity, intermediate biodiversity or lower biodiversity.

Once an emphasis option is established, objectives can be determined for the landscape level components. The intent of the seral stage target objectives is to ensure that a range of different ages of forest remain on the landscape. An important seral stage objective is the establishment of old growth management areas (OGMAs) within landscape units. These areas are reserved from harvesting in the short term but, over time, they can be harvested if a replacement area of old forest is or becomes available.

The patch size distribution objective is to ensure that there will be a range of patch sizes of all ages distributed over the landscape resembling a natural pattern. Numerous small cutblocks will increase fragmentation of the landscape. Allowing for harvesting of large blocks will provide larger patches of mature habitat nearer the end of the harvest rotation. When a large cutblock is proposed, the strategy recommends that a corresponding large area of mature or old forest be deferred from harvesting until the new cutblock has reached an age where it provides similar habitat.

The objective of connectivity is to maintain habitat integrity between representative mature or old forest ecosystems. This provides a movement corridor for both small and large animals and other organisms over time and also allows for genetic exchange. Depending on an organism's requirement, connectivity can range from being a linear riparian corridor to being a mosaic of harvested and unharvested patches that maintains continuous cover across the landscape. The necessary components for effective cover and connectivity will vary depending upon the organism.

Species with more specific habitat requirements, or spatially specific critical areas, are to be addressed through the fine filter elements described in the *Identified Wildlife Management Strategy*. That strategy was developed for selected plant and animal species considered to be particularly susceptible to the effects of forest practices. In addition, ungulate winter ranges can be designated for special management under the Code. Also, designated wildlife habitat features, such as mineral licks or bear dens, must be protected.

The landscape level and stand level components can overlap within a cutting area. For example, if there is a stream adjacent to a cutting area, the associated riparian management area may also contribute to the wildlife tree objectives for the area. When the strategy was released, government assumed that riparian management areas and other areas where harvesting is

constrained would provide 50 percent of the wildlife tree requirements in the interior and 75 percent on the coast.

1.2 Legislated Requirements

Much biodiversity management relies on policy, not law. The only legislated requirements for licensees under the Code were that forest development plans must contain statements of objectives for coarse woody debris and for wildlife tree management. Silviculture prescriptions had to be consistent with those objectives. Also, as of 2002, there was a default requirement that wildlife tree retention meet the recommended levels set in the *Landscape Unit Planning Guide* unless another applicable performance standard has been established.

Where cutblocks larger than the maximum allowed in the Code were proposed (for purposes other than salvage or forest health), the district manager had to be satisfied that the large blocks were consistent with the structural characteristics and the spatial and temporal distribution of natural openings. However, there was little guidance and no legislation on how to determine this. There were no legal requirements to manage for seral targets or connectivity under the Code, however, strategic plans such as the Vancouver Island Land Use Plan could establish legal targets for resource zones.

There are legislated requirements for addressing identified wildlife species where a wildlife habitat area has been legally established for a specific area. Similarly, there are requirements for managing ungulate winter ranges where these have been legally established, either under the Code or in a higher-level plan.

1.3 Policy Shifts Since 1995

The Forest Practices Code came into force in 1995. Since that time, there have been many amendments to both legislation and policy related to biodiversity, primarily to reduce the timber supply impacts of the Code.

The *Biodiversity Guidebook* includes a stratification of the landbase into higher, intermediate and lower biodiversity emphasis areas to provide a way to minimize timber supply impacts. In 1997, the deputy ministers of Forests and Environment, Lands and Parks (now Water, Land and Air Protection) issued a memo to decision makers to clarify the guidebook direction and make some changes. The most significant change was that forests in lower emphasis areas could be reduced to one-third of the old seral target where there were no alternative harvesting options. The full target must be met by the end of three rotations.

Legislative amendments to the Code in 1998 added a provision for the designation of ungulate winter ranges. Ungulate winter ranges that had been formally identified in management plans and adequately mapped could be grandparented in under the Code, rather than formally designated. The amendment also allowed for other winter ranges to be formally established if certain criteria were met.

Another policy amendment occurred in 1999 when the *Identified Wildlife Management Strategy* was released with a one percent timber supply impact limit. This strategy provided guidance for the establishment of wildlife habitat areas for a designated list of wildlife species and plant communities considered to be at risk. The one percent limit continues to be government policy.

Also in 1999, the *Landscape Unit Planning Guide* was released to replace the *Biodiversity Guidebook*, or at least override it where there are contradictions. It directed that early and mature seral targets should not be met unless there would be no timber supply impact. The guide stated that all lower emphasis areas should be managed to initially achieve only one-third of the old seral target regardless of a demonstrated need to do so.

In 2000, a *Provincial Wildlife Tree Policy and Management Recommendations* document was also released. This did not change the approach outlined in the *Biodiversity Guidebook* or the *Landscape Unit Planning Guide*, but did provide more background information for selecting appropriate areas for retention.

The *Biodiversity Guidebook* had no specific targets for coarse woody debris but described it as a critical element of managing for biodiversity. However, the guidebook also identified a policy conflict with utilization standards. In May 2000, a policy memo clarified that only wood below utilization standards was available for coarse woody debris. Any wood above utilization standards that was left on a block would be charged against a licensee's cut control.

The *Biodiversity Guidebook* originally described how landscape connectivity could be achieved through forest ecosystem networks, a grouping of existing constrained areas connected by mature or old forest. Later, the *Landscape Unit Planning Guide* directed that connectivity should not be managed for if there would be timber supply impacts. Connectivity could still be achieved through riparian corridors and arrangement of cutblocks, old growth management areas and other constrained areas. Under the *Operational and Site Planning Regulation*, forest ecosystem networks that were established prior to the Code coming into effect in 1995 were to continue to be recognized until landscape unit planning is complete or until an old growth management area is established within the landscape unit.

2.0 Methodology

The *Biodiversity Guidebook, Landscape Unit Planning Guide* and *Identified Wildlife Management Strategy* were used as a baseline for examining the implementation of the strategy. The information was obtained by interviewing key government staff across the province, followed by completion of a questionnaire. The three government agencies involved in forest management were contacted in every forest district to collect planning level information on the various components of the Code's biodiversity strategy. Landscape level data was provided by staff at Ministry of Forests (MOF) district offices and Ministry of Sustainable Resource Management (MSRM) regional offices. MOF districts provided information on stand level operational issues. Information on the *Identified Wildlife Management Strategy* and on ungulate winter ranges was provided by the Ministry of Water, Land and Air Protection (MWLAP). For convenience, results are reported on a forest district basis. In total, 55 people were interviewed.

Because the questionnaire dealt with management activities that often took place before the consolidation of forest districts and regions in 2003, the old forest district names are used in reporting the results. It is important to note that results presented in the table are not a report on any one agency. The results are presented by forest district because it is the only practical administrative unit and because the information was generally collected by district.

Two recent changes complicated the investigation. One was the shift of many planning responsibilities from MOF to MSRM in 2001. This has resulted in some information gaps. The other change was closure of a number of forest district offices. Information on those districts had to be gathered from districts taking over responsibility for those areas. Even so, complete information was not obtained for three of the former districts. These three districts appear as having "no data" in the maps that illustrate the results in section 3.0.

This study did not involve on-the-ground assessment and does not address the effectiveness of the strategy or policies to conserve biodiversity. Also, this report does not include initiatives that licensees may be conducting on their own or under certification programs, where they may be implementing and monitoring more components for biodiversity than are indicated for that area in this report.

Results from the questionnaire were scored for each of 10 criteria used to measure the implementation of the biodiversity strategy:

- landscape units defined (but not necessarily designated)
- biodiversity emphasis options
- seral stage monitoring occurring
- mature and old seral stages monitored
- old growth targets met in landscape units
- old growth management areas spatially defined
- patch size monitored
- wildlife tree retention
- connectivity managed
- riparian reserves established

Scores were given for each implementation criterion. The maximum value for any criterion is 1.0. For some criteria, 0.5 was given for partial implementation, and 0 for no implementation. A continuous range of values between 0 and 1.0 (i.e., 0.3 or 0.8) was not used because agencies were not able to provide information at a level of detail that would allow a finer scale of evaluation. Each criterion was worth 10 percent of the total mark. The criteria were weighted equally for ease of assessment and the weighting does not necessarily reflect the relative importance of each criterion to conservation of biodiversity.

The score for each criterion was summed to provide the total score out of 10 for each district. This provides an overall implementation score for each district. This also allows for comparison of the implementation between districts. The results are presented in provincial maps showing the distribution and spatial patterns for implementation of each criterion. The district scores for all criteria are found in Appendix 1.

The score for each criterion was also summed across each of the 39 districts and reported as a percentage rating (see Table 3). This provides a measure of the level of provincial implementation for the particular criterion.

In addition to the above criteria, information was also collected for three components of the biodiversity strategy that were not scored:

- coarse woody debris management
- ungulate winter ranges
- wildlife habitat areas

Coarse woody debris management was not included in scoring because little was reported due to the conflict with utilization standards. Scores for ungulate winter range and wildlife habitat areas were not assigned because the data applied to MWLAP regions and could not be broken down to the forest district level.

Abbreviations used in the maps are as follows:

Cariboo Forest Region

CH	Chilcotin
HO	Horsefly
QU	Quesnel
WL	Williams Lake
MH	100 Mile House

Kamloops Forest Region

CL	Clearwater
KA	Kamloops
LI	Lillooet
ME	Merritt
PE	Penticton
SA	Salmon Arm
VE	Vernon

Nelson Forest Region

AR	Arrow
BO	Boundary
CO	Columbia
CB	Cranbrook
IN	Invermere
KL	Kootenay Lake

Prince George Forest Region

DC	Dawson Creek
FN	Fort Nelson
JA	Fort St. James
JO	Fort St. John
MK	100 Mile House
PG	Prince George
RV	Robson Valley
VA	Vanderhoof

Prince Rupert Forest Region

BC	Bulkley
CA	Cassiar
KM	Kalum
KI	Kispiox
LA	Lakes
MO	Morice
NC	North Coast

Vancouver Forest Region

CR	Campbell River
CK	Chilliwack
MC	Mid Coast
PN	Port McNeill
QC	Queen Charlotte Islands
SI	South Island
SQ	Squamish
SC	Sunshine Coast

3.0 Findings

A description of each criterion, the scoring system, and the principal findings, is provided in this section. A series of maps illustrates the distribution of scores for the districts for each criterion. A summary map shows the total score for each district across the ten scored criterion.

3.1 Landscape Units Defined

10% of total score

Much of the biodiversity strategy was intended to be implemented through landscape unit plans. Landscape units were designed to cover one or more watersheds. The province was divided into over 1200 landscape units. (Under the MSRM's new planning process, plans will no longer be developed for individual landscape units. Instead, some 150 sustainable resource management plans, or SRMPs, each covering multiple landscape units, are to be developed.)

Criteria:

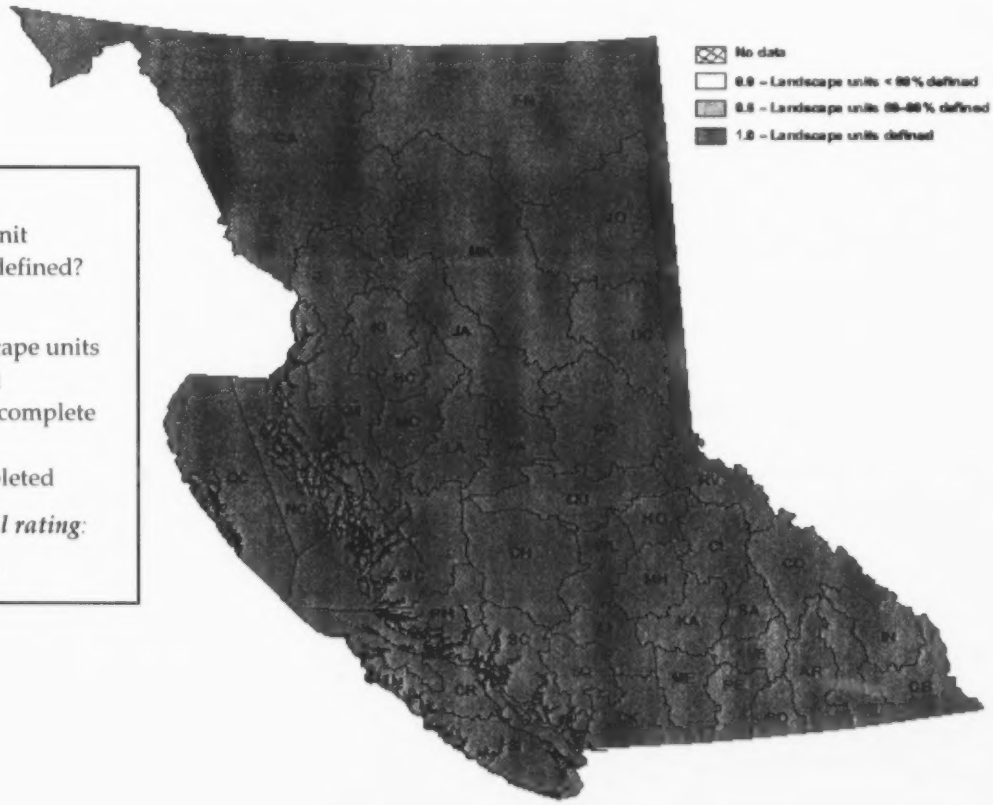
Have landscape unit boundaries been defined?

Scoring:

- 1.0 – if all landscape units are defined
- 0.5 – if partially complete 50-90%
- 0 – if not completed

Overall provincial rating:

100%



Landscape Units Defined

All districts scored 1.0.; however, few landscape units are legally established. As of December 2003, only 32 out of the 1200 landscape units were established with legal objectives, these objectives primarily being for old growth management areas and wildlife tree retention and in some cases additional biodiversity components. An old growth order proposed by government will legally establish all remaining landscape unit boundaries and will also establish non-spatial old growth objectives for the entire province.

3.2 Biodiversity Emphasis Options

10% of total score

Three biodiversity emphasis options (BEOs) were developed to mitigate timber supply impacts: higher, intermediate and lower biodiversity emphasis. A lower designation provides fewer opportunities to manage for biodiversity in a landscape unit. The level of biodiversity management in the province will be affected by how extensively the lower designation is applied. Government policy is to apply the lower emphasis to 45 percent of the provincial forest, the intermediate emphasis to 45 percent and the higher emphasis to 10 percent of the provincial forest.

Criteria:

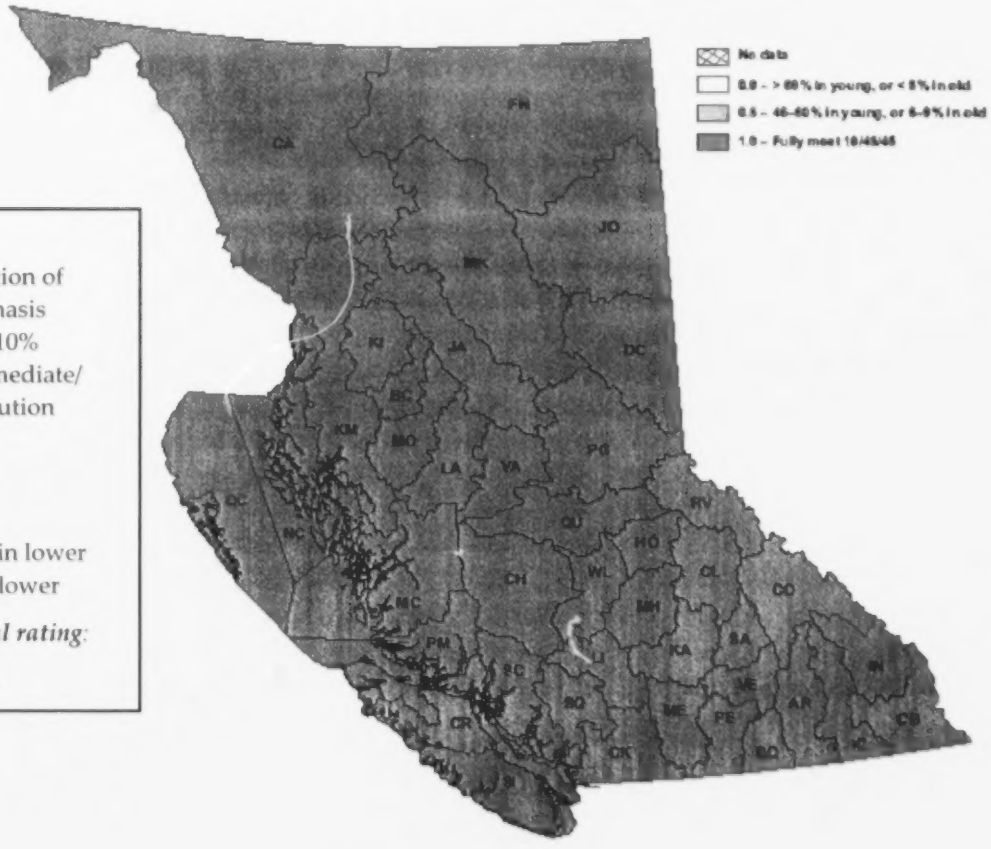
Does the distribution of biodiversity emphasis options meet the 10% higher/45% intermediate/ 45% lower distribution policy?

Scoring:

- 1.0 – for yes
- 0.5 – if 46 - 55% in lower
- 0 – if > 55% in lower

Overall provincial rating:

100%



BEO Meet 10/45/45 Distribution

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Criteria:

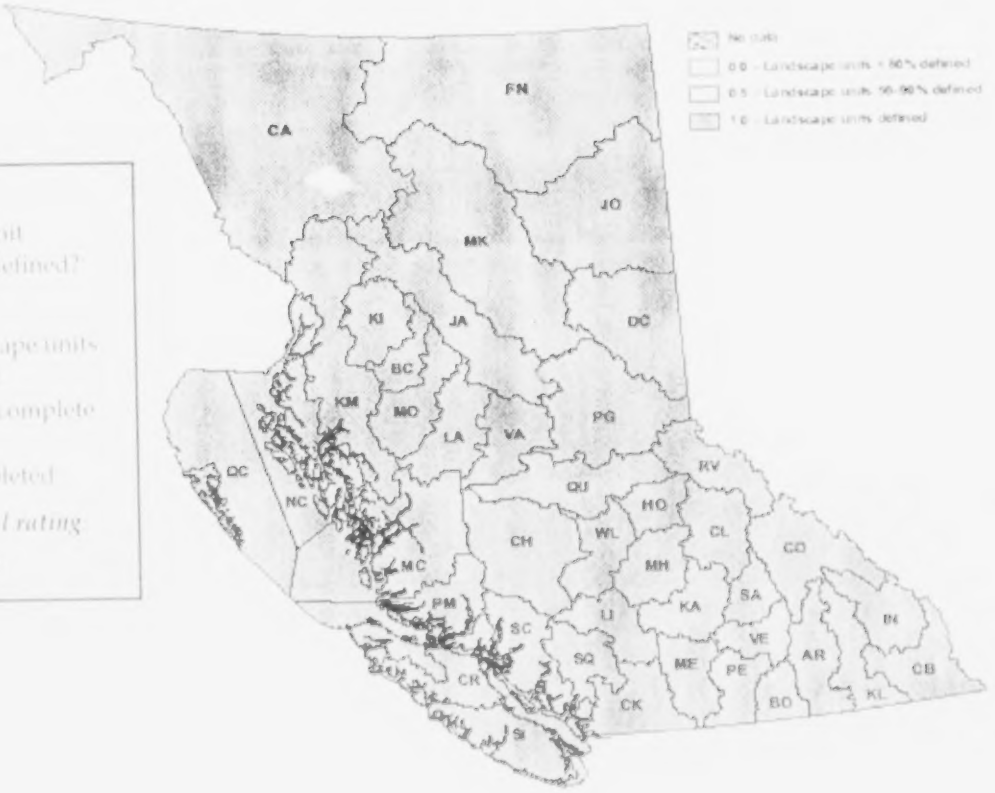
Have landscape unit boundaries been defined?

Scoring:

- 1.0 – if all landscape units are defined
- 0.5 – if partially complete 50-99%
- 0 – if not completed

Overall provincial rating:

100%



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Criteria:

Does the distribution of biodiversity emphasis options meet the 10% higher/45% intermediate/ 45% lower distribution policy?

Scoring:

- 10 – for yes
- 0 – if 40% < 55% in lower
- 0 – if > 55% in lower

Overall provincial rating

100%

BEO Meet 10/45/45 Distribution

Every district scored 1.0. The emphasis options were applied as specified in government policy with relatively few exceptions. The Cassiar district, Clayoquot Sound special management zone and parts of the central coast where an LRMP is under development are the only areas without any biodiversity emphasis options.

However, there was some variation in how the options were applied. Most districts applied one emphasis option to each landscape unit, but several districts subdivided landscape units into different emphasis options. In the areas covered by the Kamloops LRMP (Kamloops and Clearwater districts), the emphasis options were applied across the two districts. This resulted in the Clearwater district having a greater proportion of lower emphasis landscape units and Kamloops a lesser proportion so that, over the whole LRMP area, the 10/45/45 guideline was met. This approach is consistent with the strategy.

The *Biodiversity Guidebook* also recommended that the low emphasis option not be applied to more than 50 percent of any biogeoclimatic subzone within a subregional plan or forest district. In the Golden and Revelstoke districts, the lower emphasis was applied to significantly more than 50 percent of many biogeoclimatic subzones. This resulted from a zonation based on elevation; most of the lower emphasis was placed at higher elevations so that there was more opportunity to manage for biodiversity in the valley bottom corridors.

3.3 Seral Stage Monitored, Including Old and Mature Forest

20% of total score

Different ages of forest provide habitat for different species of organisms; some species are dependent upon habitat found in young forests and others are dependent upon the habitat found in mature or older forests. These different ages of forest are called "seral stages." Depending on the disturbance history of the landscape, the amount of young forest or old forest will vary across the province and, over time, in any given area. Much of the biodiversity strategy is based upon the concept that there is less risk to biodiversity if forests are managed to reflect a natural disturbance pattern. This includes managing for levels of each forest age that approach what might have occurred naturally. The strategy groups the forest into early, mature and old seral categories and includes guidelines to maintain a proportion of the planning area in each of these categories. These proportions are referred to as seral targets.

The *Landscape Unit Planning Guide* modified the original guidance in the *Biodiversity Guidebook* by making the old forest target the priority for biodiversity management along with wildlife tree retention. The LUPG advises not managing for other aspects of the strategy, such as the targets for early or mature forest, unless there will be no timber supply impact.

The actual seral stage targets were based on estimates of historic natural levels of each stage. These were then modified as required to reduce impacts on timber supply. For example, the target for old forest was initially set at one half of the estimated natural level of old forest on the landscape. This value was then reduced by a further 12 percent to account for the amount of old growth that was assumed would be preserved in protected areas (see appendix 4 of the *Biodiversity Guidebook*).

For the early seral stage, the target amount was twice the estimated natural level of early forest. That target was set as a maximum level because young forest was generally abundant. In contrast, the recommended targets for mature and old seral forest were intended to be minimum levels below which it was assumed there would be significant risks to biodiversity. The targets were intended to provide enough flexibility to not significantly constrain harvest planning. The targets could not be met immediately in much of the province because of the harvesting history. Instead, it was recommended that districts manage toward the targets.

Harvesting and natural disturbances affect the proportions of all ages of forest on the landscape. To know the effect of proposed harvesting on the seral targets it is necessary to keep track of the current condition of the planning area.

Criterion 1: *(10% of score)*

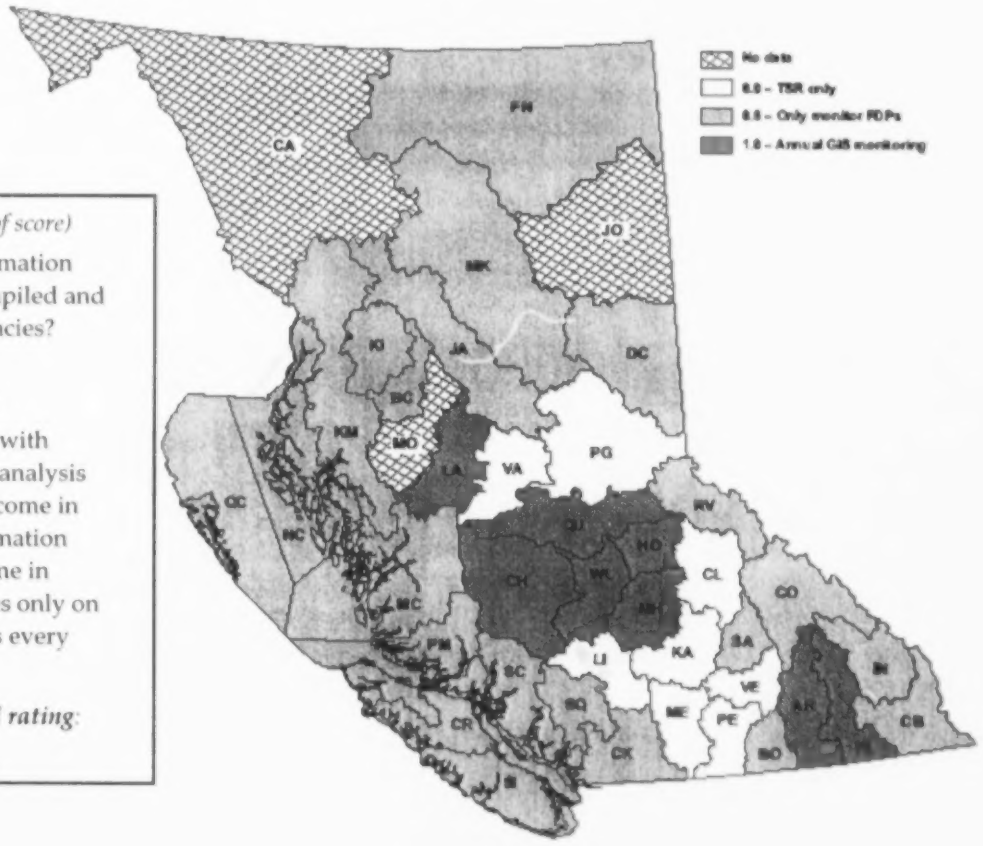
Is seral stage information being actively compiled and monitored by agencies?

Scoring:

- 1.0 – summarize seral status with annual GIS analysis or as FDPs come in
- 0.5 – check information as FDPs come in
- 0 – district relies only on TSR updates every 5 years

Overall provincial rating:

47%



Monitor Seral Stages

For the early seral stage, the target amount was twice the estimated natural level of early forest. That target was set as a maximum level because young forest was generally abundant. In contrast, the recommended targets for mature and old seral forest were intended to be minimum levels below which it was assumed there would be significant risks to biodiversity. The targets were intended to provide enough flexibility to not significantly constrain harvest planning. The targets could not be met immediately in much of the province because of the harvesting history. Instead, it was recommended that districts manage toward the targets.

Harvesting and natural disturbances affect the proportions of all ages of forest on the landscape. To know the effect of proposed harvesting on the seral targets it is necessary to keep track of the current condition of the planning area.

Monitor Seral Stages

Criterion 1: *(10% of score)*

Is seral stage information being actively compiled and monitored by agencies?

Scoring:

- 1.0 – summarize seral status with annual GIS analysis or as FDPs come in
- 0.5 – check information as FDPs come in
- 0 – district relies only on TSR updates every 5 years

Overall provincial rating:

47%

The Board found that there were different levels of monitoring across the province. Provincially the most common score for monitoring seral stages was 0.5. For 8 districts all located in either the Kamloops or Prince George regions, there was no monitoring reported.

Each timber supply area within a district will have a timber supply review done approximately every five years. A seral stage analysis is part of that process. In some forest districts this was the only analysis that was available and neither MOF nor MSRM was actively monitoring seral stages. For most districts, MOF checked seral information that licensees provided when forest development plans were submitted for approval. Finally, in two regions MSRM is conducting a GIS analysis of seral stages for all the districts. In the Cariboo region, MSRM does this analysis each year and provides the results to the MOF districts. In the Nelson region MSRM is beginning a seral analysis program but did not know yet if it will be done on a regular basis.

Criterion 2: *(10% of score)*

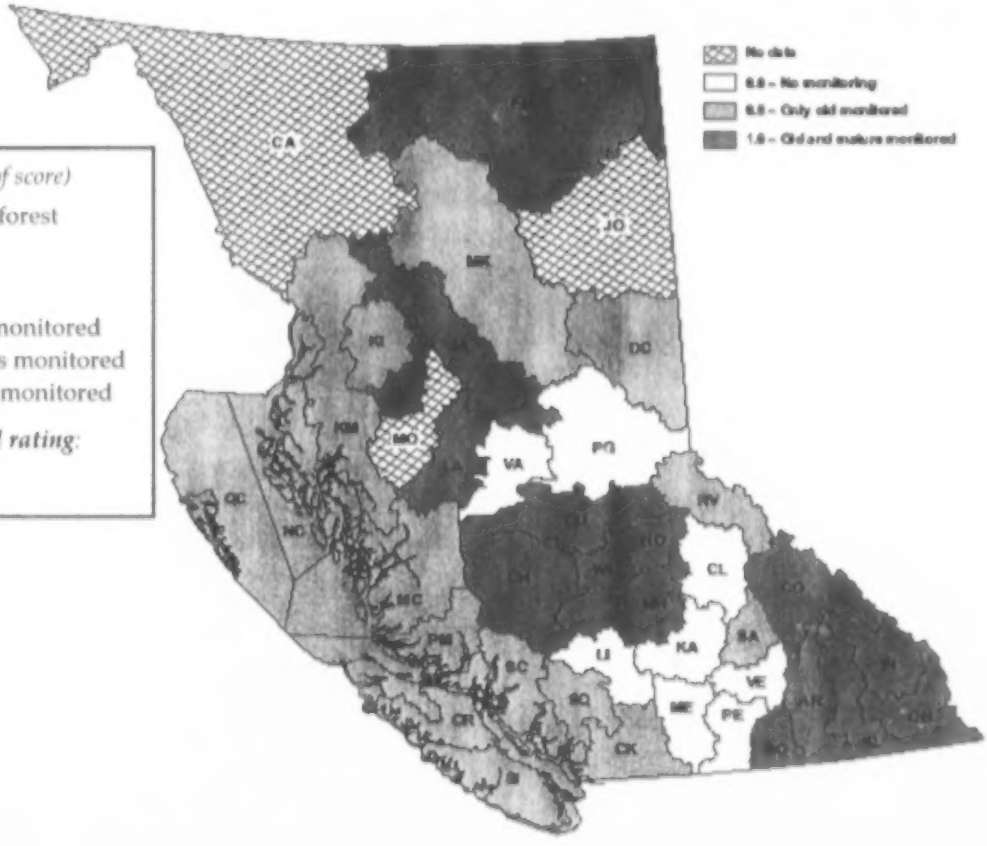
Is mature and old forest monitored?

Scoring:

- 1.0 – if both are monitored
- 0.5 – if only old is monitored
- 0 – if neither is monitored

Overall provincial rating:

60%



Monitor Mature and/or Old

There was also variation in which seral stages were monitored. For approximately half of the districts where monitoring was reported, both mature and old seral targets were looked at. In some cases, early seral was also included. For the other districts only the old seral targets was monitored.

3.4 Old Growth Management Areas Defined and Old Growth Targets Met in Landscape Units

20% of total score

The strategy includes spatially defining where old growth will be retained to meet the old seral target. These areas are called old growth management areas or OGMAs.

Two criteria—the level of old seral target achievement and the identification of draft old growth management areas—were considered. The current level of old seral forest is not specifically an implementation measure but it is a measure of how close areas are to achieving the old seral target. The rationale for just looking at draft old growth management areas and not formally established ones is that there are few areas where OGMAs are established and, in all districts but one, draft OGMAs are treated as if they are established. In 2001, the responsibility for planning OGMAs moved from MOF to the newly formed MSRM.

Criterion 1: *(10% of score)*

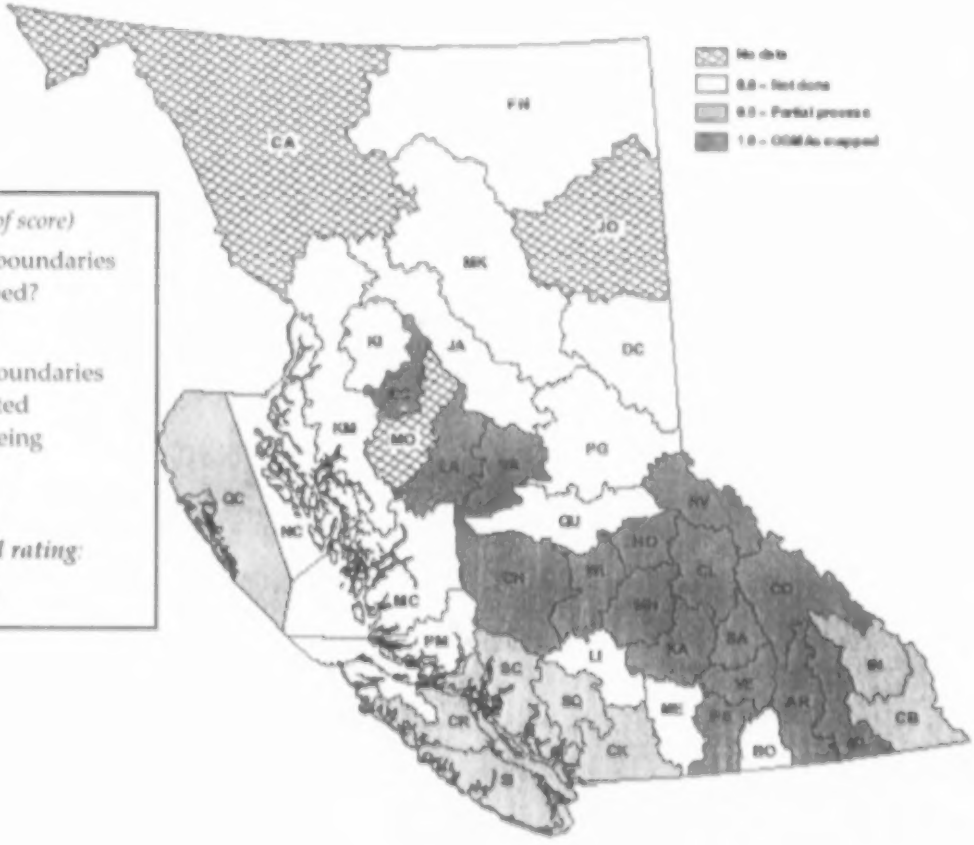
Are draft OGMA boundaries defined and mapped?

Scoring:

- 1.0 – if OGMA boundaries are completed
- 0.5 – if close to being completed
- 0 – if not done

Overall provincial rating:

55%



OGMAs – Draft Spatial

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Criterion 2: (10% of score)

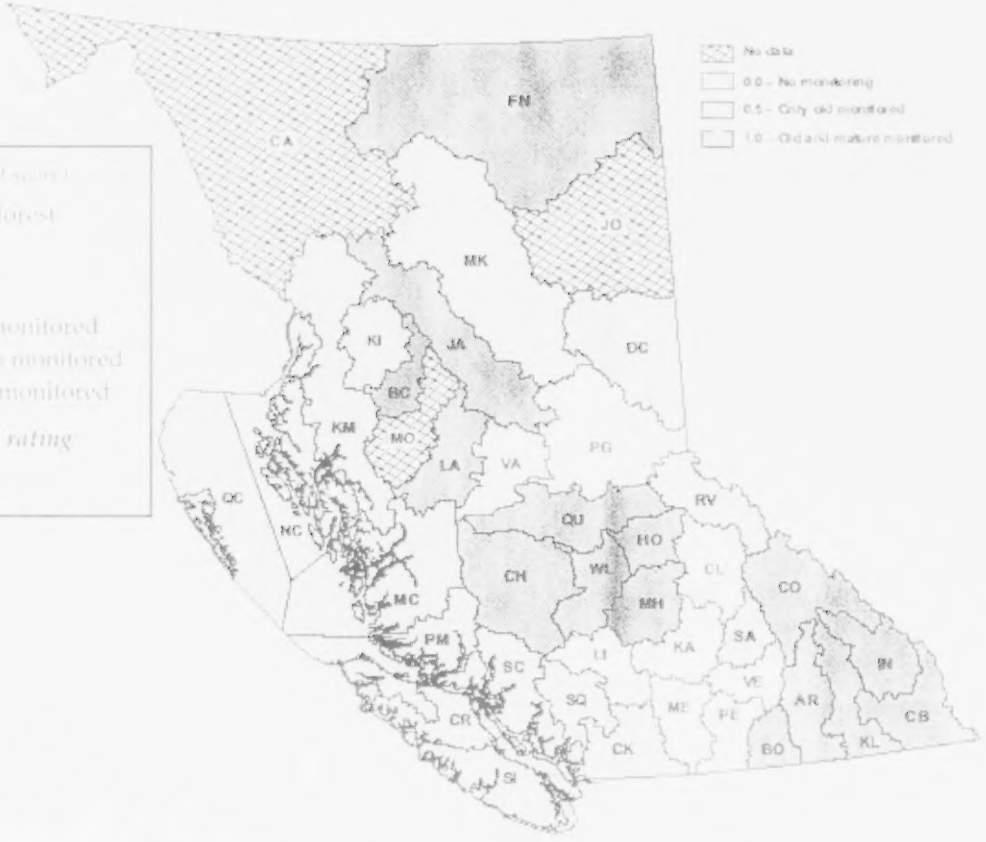
Is mature and old forest monitored?

Scoring:

- 1.0 – if both are monitored
- 0.5 – if only old is monitored
- 0 – if neither is monitored

Overall provincial rating

60%



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Criterion 1: (10% of score)

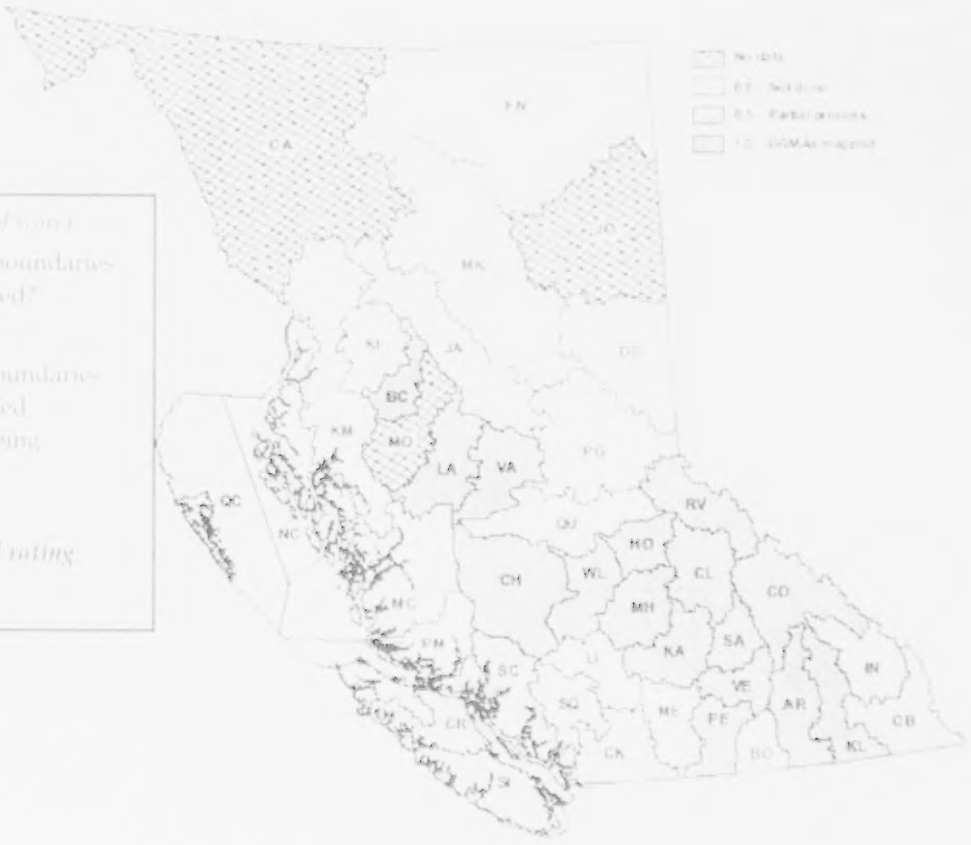
Are draft OGMA boundaries defined and mapped?

Scoring:

- 1.0 – if OGMA boundaries are completed
- 0.5 – if close to being completed
- 0 – if not done

Overall provincial rating

55%



OGMAs – Draft Spatial

Initial government direction was that OGMA objectives were to be established by July 2002. This target date has not been met. As of December 2003, OGMAs have been formally established in 32 of the 1200 landscape units in the province. However, OGMAs have been identified spatially in a draft form for most of the province. In most of the province, draft OGMAs are treated the same as if they had been established and are reserved from harvesting until the OGMA planning process is complete.

Sixteen districts had draft OGMA boundaries completed. Another eight districts were close to completion. Two districts reported that OGMA planning had not happened because there was an obvious abundance of old growth so that it was not considered a priority. In some cases, an ongoing LRMP process had delayed OGMA planning.

Both the Bulkley and Revelstoke districts have taken a different approach to managing old forest. OGMAs are not being planned for specifically. The Bulkley district established core areas and the Revelstoke district has established corridors within which old forest is managed. Some districts reported that OGMA planning had stalled with the changeover from MOF to MSRM, however, the situation has since improved.

Criterion 2: (10% of score)

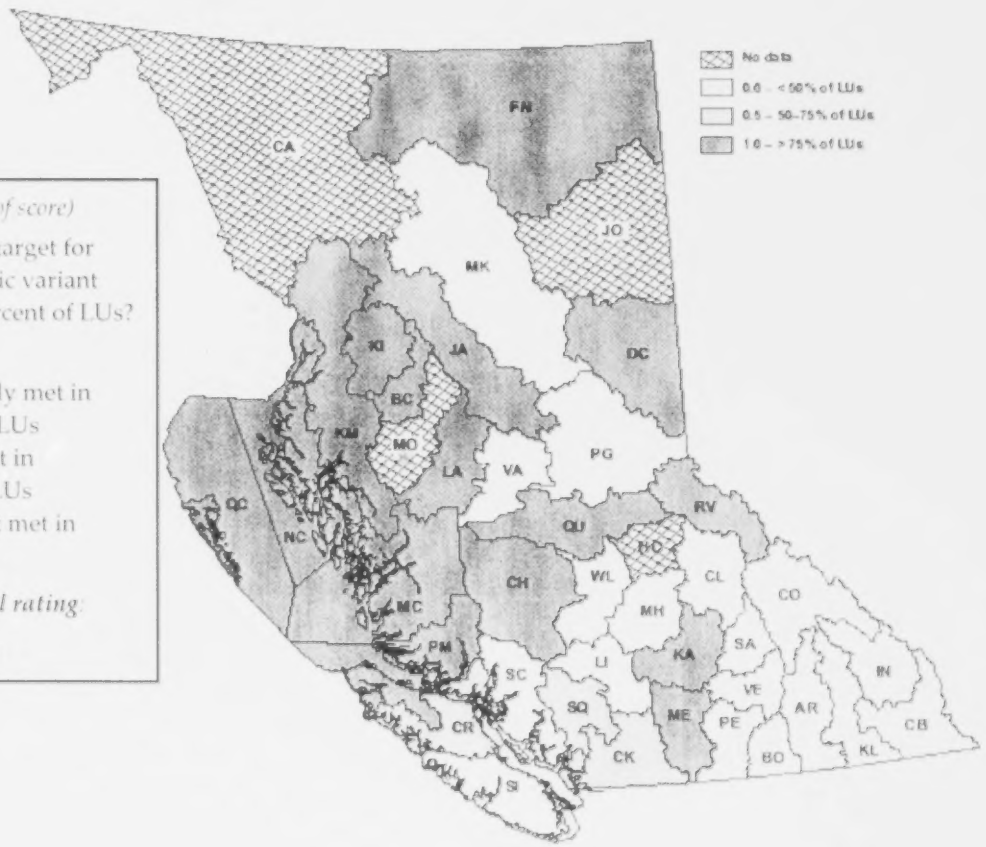
Is the old growth target for each biogeoclimatic variant fully met in 75 percent of LUs?

Scoring:

- 1.0 – if target fully met in 75% of the LUs
- 0.5 – if target met in 50-75% of LUs
- 0 – if target not met in 50% of LUs

Overall provincial rating:

46%



Meet Old Seral by BEC Variant

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Criterion 2: *(10% of score)*

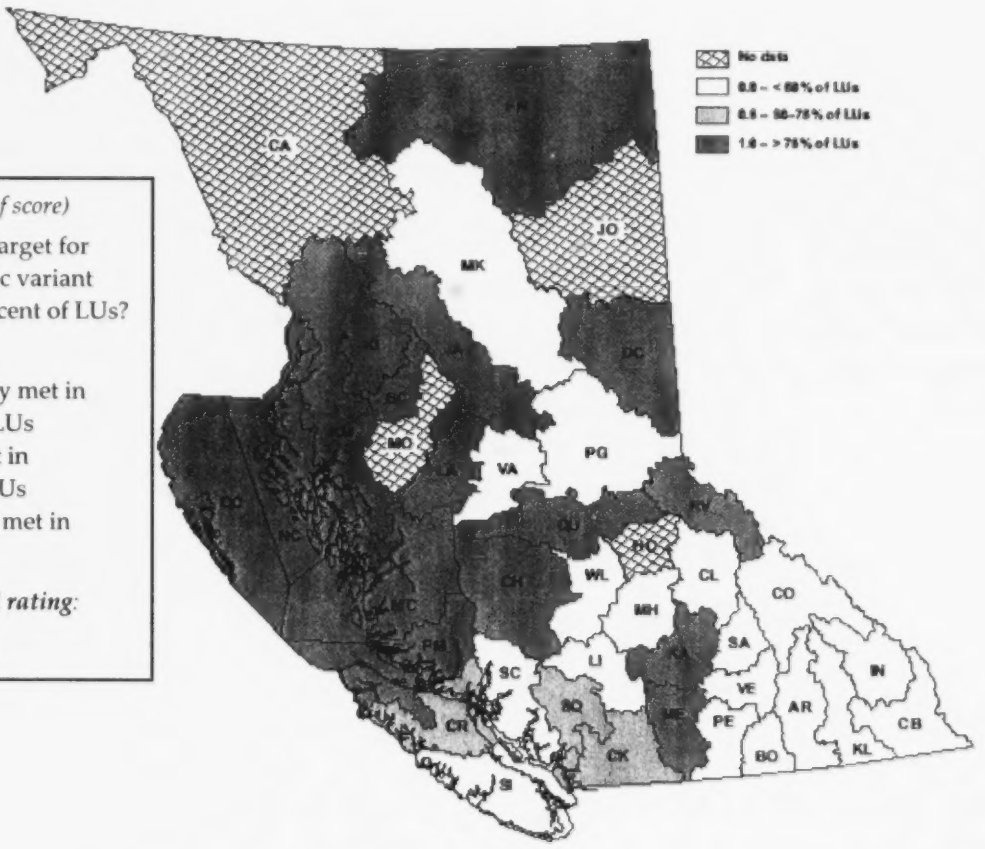
Is the old growth target for each biogeoclimatic variant fully met in 75 percent of LUs?

Scoring:

- 1.0 – if target fully met in 75% of the LUs
- 0.5 – if target met in 50-75% of LUs
- 0 – if target not met in 50% of LUs

Overall provincial rating:

46%



Meet Old Seral by BEC Variant

The Board asked whether each district currently met the old seral target for all biogeoclimatic (BEC) zones in 75 percent or more of the landscape units (criterion 1). Only 16 districts met this criterion; mostly in the northern interior. No districts in the south part of the Coast region or Rocky Mountain region met this criterion.

In most landscape units, the target could be met in the majority of BEC zones but often there were one or two zones that were in deficit. Many districts reported that the old seral target was not met because there was a shortage of age class 9 stands. Often they believed that the apparent shortage is not a result of past harvesting but due to obsolete inventories that show many areas classified as age class 8 that are now age class 9. In some districts, age class 8 stands were considered to have adequate structural characteristics to achieve the intent of the old seral target.

Most districts reported that mature forest was required or used to complete OGMA planning. This was not necessarily because of an old forest deficit. When OGMAs were spatially defined, it was often preferable to include mature forest adjacent to an old stand and make a larger OGMA, rather than using smaller isolated patches of old forest elsewhere on the landscape. If there was a deficit of old forest (i.e., less than the target amount), mature or young forest can be added to the OGMA and left to eventually become additional old forest.

The policy in the LUPG states that the old forest in landscape units with a lower biodiversity emphasis option can be "drawn down" to one-third of the target amount in the short term but that the full target amount must be met over the next three rotations (roughly 200 years). The full target should be applied in intermediate and higher emphasis areas. Most districts reported that they did not plan to draw down the existing old forest in the intermediate and higher emphasis landscape units below the recommended level as per policy. However, the need to control mountain pine beetle or salvage beetle-killed forest will likely cause draw downs below the target level. Despite the policy to draw down the old forest in lower emphasis landscape units, for 18 districts there was no intention to do this.

The use of protected areas to meet the old seral target was not consistent across the province. These areas were considered when the old seral targets were developed for the strategy. However, the strategy allows for these areas to be counted again to contribute to meeting the old seral target within a landscape unit. But this was not done in all districts. Also, in some districts, protected areas were used to achieve as much of the target as possible while other districts reported that protected areas were only used proportional to the area that the park represented on the landscape. For example, if a protected area made up only 10 percent of a landscape unit, it would be used to contribute to only 10 percent of the old target.

3.5 Patch Size Monitored

10% of total score

The Forest Practices Code established default maximum limits for cutblock size of 40 hectares in the southern parts of the province (Coast, Kamloops, Nelson) and of 60 hectares in the rest of the province. Widespread restriction to small cutblocks would have increased the fragmentation of forested areas, so the guidebooks recommended a range of patch sizes, including large blocks. The range was based on the current knowledge of historic disturbance patterns for given areas. A range of patch sizes would also better emulate natural patterns of disturbance and thus provide a range of habitat patch sizes that are suitable for all organisms in that landscape. The Cariboo Region biodiversity conservation strategy states: "... managing the total area of each seral stage (meeting seral target percentage targets) must be combined with management of seral stage patch sizes in order to effectively reduce risks to biodiversity."

Implementing a range of patch sizes was achieved through section 11 of the *Operational and Site Planning Regulation (OSPR)*. That regulation allowed the district manager to approve larger cutblocks for forest health, salvage and biodiversity. In order to approve large blocks for biodiversity purposes, the district manager must be satisfied that the proposal is consistent with the spatial, temporal and structural characteristics of natural disturbances. This requires some knowledge of the existing patch situation on the landscape and how it will be affected by the proposal. The Code provided the same recommended patch size distributions in both the *Biodiversity Guidebook* and the *Landscape Unit Planning Guide*. The intent is to initially achieve the patch size distribution in the younger patches so that the distribution will cover all ages of patches across the landscape by the end of the rotation.

Patch size monitoring was reported for 17 districts. This was most consistent in the Cariboo Region because MSRM did the analysis in that region and provided it to the districts. Approximately half of the monitoring in the province was done by MSRM and half by MOF.

One explanation given for not monitoring was that licensees do not submit cutblocks over the default maximum unless for a partial cut. With few or no large blocks, there was no perceived need to monitor patches. Often patch size distribution was considered only when a proposal for a large cutblock was submitted for approval under section 11 of the OSPR. The licensee would usually be required to provide an analysis of patch size distribution with the submission. This approach, to only trigger a review when large patches are proposed, is not consistent with the intent of the strategy, although it meets the requirements of the regulation.

Criteria:

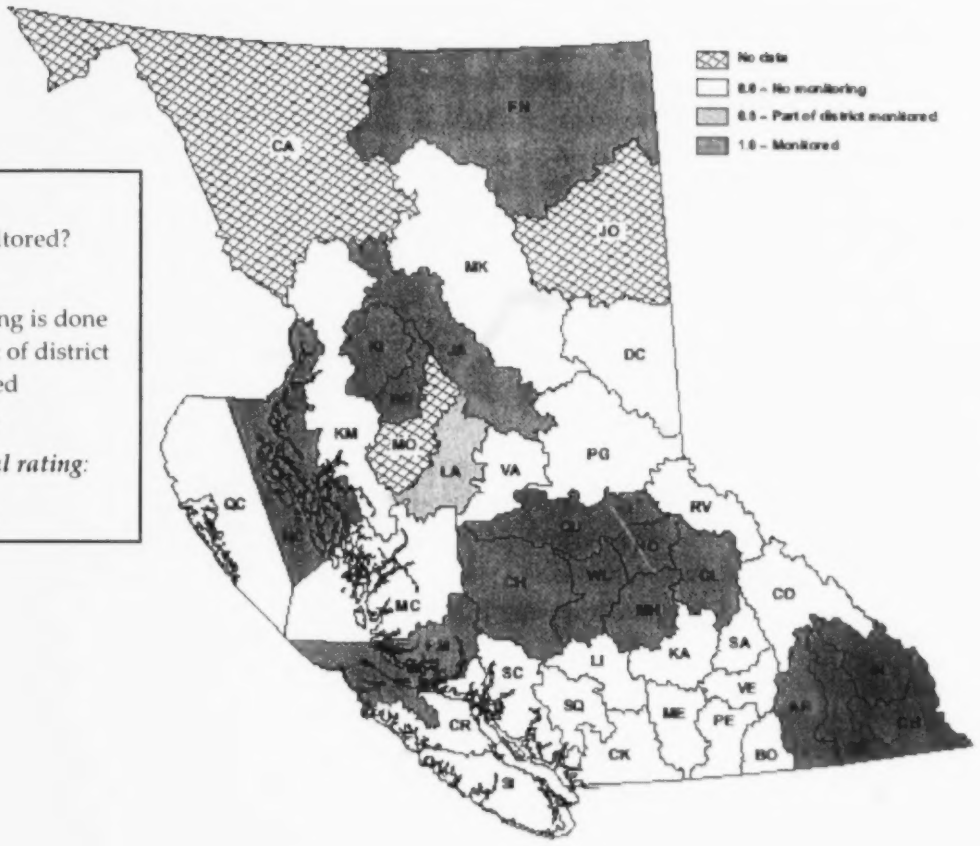
Is patch size monitored?

Scoring:

- 1.0 – if monitoring is done
- 0.5 – if only part of district is monitored
- 0 – if not done

Overall provincial rating:

42%



Monitor Patch Size

The patch size recommendations were intended to encourage practitioners to apply a range of patch sizes. The need for this approach came from the concern that the landscape would be overly fragmented with smaller cutblocks. It was not intended to only limit larger cutblocks but also to place limits on smaller ones. One feature of larger habitat patches that is considered important for some forest dwellers is called 'interior forest.' This is essentially that part of the patch that is less influenced by outside factors such as wind or predators. This can result in an area with a different micro-climate and a reduced risk of predation.

Additional guidance on managing patch sizes has been developed separately by forest ecologists in three MOF regions: Cariboo, Kamloops and Prince George. The biodiversity strategy committee in the Cariboo Region went beyond the *Biodiversity Guidebook* recommendations for patch size. They do not believe that the 'indirect approach' of the guidebook, combining seral stage distribution with harvest unit size recommendations, will necessarily maintain large patches of mature and old forest in either the short or long term. The Cariboo committee therefore recommend managing directly for mature and old forest patches. They also believe that applying the patch size recommendations to older forest might result in existing large older forest patches being reduced to meet the distribution requirements. They

recommend a different distribution for older patches. They also recommend aggregating cutblocks to maintain large areas of existing mature and old forest.

Kamloops Region MOF staff also produced local recommendations for guidance on developing large aggregate cutblocks. The concern was that the LUPG approach of only looking at recent cutblocks would be biased towards smaller cutblocks and would lead to greater fragmentation. That approach was also criticized as ignoring natural processes still occurring on the landscape.

In the Prince George Region, MOF staff developed a new approach based on the 'range of natural variability' without consideration for timber supply impacts. That contrasts with the compromise between biodiversity and timber management that is fundamental in the *Biodiversity Guidebook* and the LUPG. The Prince George approach divides the landscape into natural disturbance units rather than natural disturbance types. These NDUs are more refined, reflecting local differences in succession and stand structure. The Prince George approach also promotes a different distribution of patch sizes, recommending larger aggregate units and providing guidance for old interior forest patch size to ensure there are larger patches of old forest. Nevertheless, the basic concept is similar to the *Biodiversity Guidebook*, with management guidance based on natural disturbance patterns.

In summary, there is inconsistent interpretation and implementation of patch size recommendations across the province. Given the diversity of landscapes in the province, it is appropriate that various regions follow flexible application. However, it is not desirable to have a variety in interpretation of the intent of patch size management.

3.6 Wildlife Tree Retention

10% of total score

Wildlife tree patches are the primary means of managing biodiversity at the stand level. The Code requires that FDPs contain a statement of objectives for wildlife trees. The *Biodiversity Guidebook* and LUPG contain a table with recommended levels of retention that varies between 0 and 15 percent, depending on harvesting history, where landscape units have been designated with a biodiversity objective. In the absence of landscape unit designation and biodiversity objectives the recommended levels for wildlife tree retention are three percent greater.

Criteria:

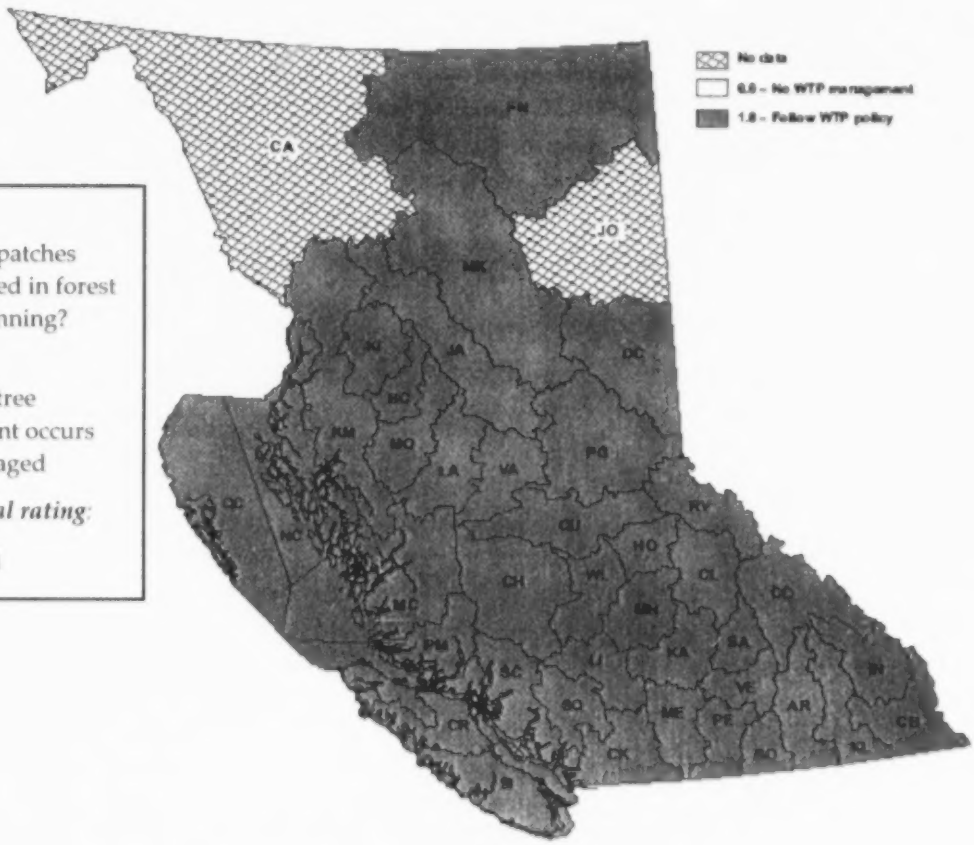
Are wildlife tree patches being implemented in forest development planning?

Scoring:

- 1.0 – if wildlife tree management occurs
- 0 – if not managed

Overall provincial rating:

100%



WTP Management

All districts reported that they followed this guidance. Some districts had done the analyses and provided licensees with proposed levels of retention by landscape unit. Other districts had simply summarized the guidance on wildlife tree objectives and provided that to the licensees. No districts had policies that were notably different from the provincial policy.

Most districts also reviewed the wildlife tree retention levels proposed in silviculture prescriptions as they were submitted for approval, to ensure they were consistent with the forest development plan and wildlife tree tables.

All but five districts reported that they followed a 500-metre guideline for the maximum distance between tree patches. The intent of this guideline is to maximize the use of a cutblock by wildlife by ensuring that there are not areas within cutblocks that are too far from cover.

Effective, long-term management of wildlife trees requires an understanding of the purpose of each wildlife tree patch. The objective may range from simply meeting the retention objective with trees representative of the stand to maintaining nesting trees or protecting features such as a bear den. However, districts rarely reported that licensees provided specific management objectives for individual wildlife tree patches in a silviculture prescription. Instead, licensees tended to include a very general purpose statement in the silviculture prescription about retaining wildlife tree patches for biodiversity.

3.7 Management for Connectivity

10% of total score

Different organisms will utilize forest connectivity differently depending on different micro-site or macro-site habitat requirements. The *Biodiversity Guidebook* discussed the importance of maintaining connections on the landscape. It used the concept of forest ecosystem networks or FENs which had been developed before the Code. The FEN concept made use of existing constrained areas such as deer winter ranges and riparian areas and connected these with corridors of mature or old forest. The guidebook explains that the natural levels of connectivity are different among the NDTs depending upon the frequency and intensity of disturbance events.

The *Landscape Unit Planning Guide* does not provide any further guidance except to state that connectivity should not be managed for if it will have a timber supply impact. It provides suggestions on how some levels of connectivity can be achieved without impacts by using existing constrained areas and through the positioning of harvest areas.

There is no requirement in the *Forest and Range Practices Act* or regulations to manage for connectivity.

Criteria:

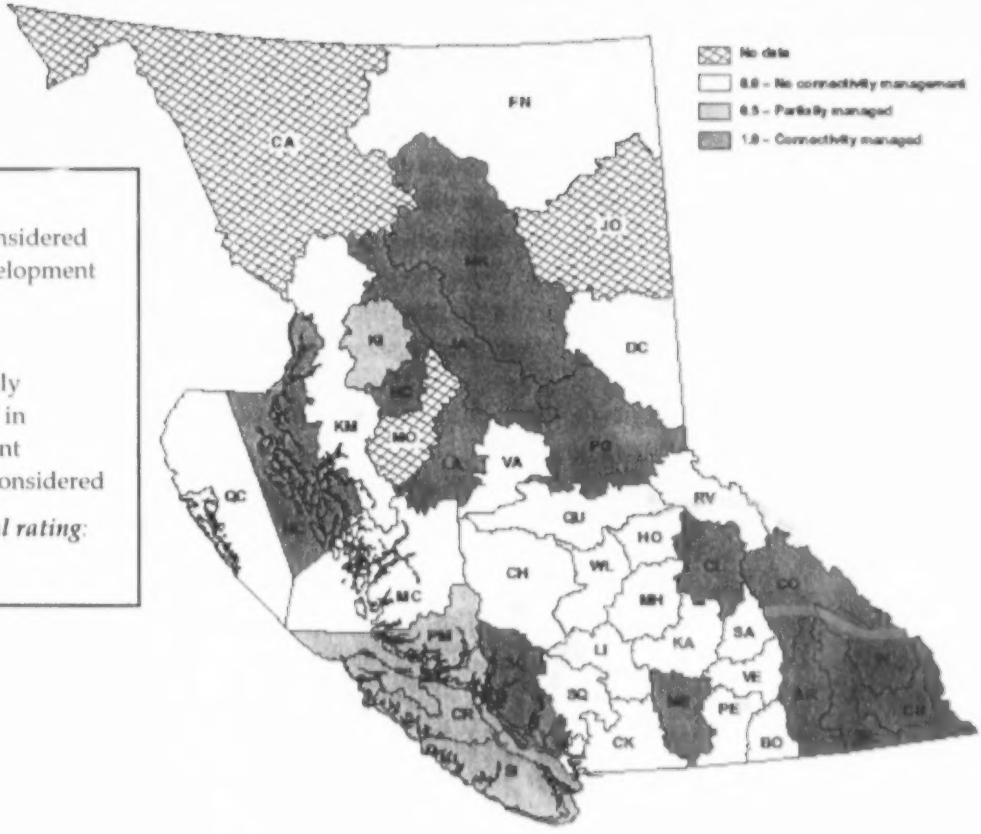
Is connectivity considered during forest development planning?

Scoring:

- 1.0 – if specifically considered in management
- 0 – if it is not considered

Overall provincial rating:

44%



Manage for Connectivity

Thirteen districts reported that they have managed for connectivity. Often this has occurred as part of a strategic planning process that has identified movement corridors for large animals. In some cases, districts reported that they consider connectivity when they review the spatial and temporal location of proposed cutblocks. Connectivity is associated with riparian corridors. Along larger fish-bearing streams it can be expected that some amount will be maintained. In general however, there appears to be little active management for connectivity on the landscape.

3.8 Riparian Reserves Established

10% of total score

The *Riparian Management Area Guidebook* describes a strategy for maintaining aquatic and terrestrial biodiversity along streams, lakes and wetlands. Forest reserves ranging from 20 to 50 metres, or width of the floodplain if larger, are legislated requirements along fish- bearing streams greater than 1.5 metres wide. Riparian management areas, but no reserves, are required along non- fish bearing streams. Riparian reserves of 10 metres wide are also legislated requirements along larger lakes and wetlands. Riparian management areas up to 20 metres wide are intended to protect the reserves from windthrow and minimize intrusions by roads.

The strategy behind this scheme of riparian protection is primarily for protection of fish habitat, but also considers that the lower gradient, alluvial streams contain more valuable riparian habitat for wildlife. Steeper gradient streams have riparian management zones, generally with retention of a site-specific amount of non-merchantable deciduous cover.

***Criteria*:**

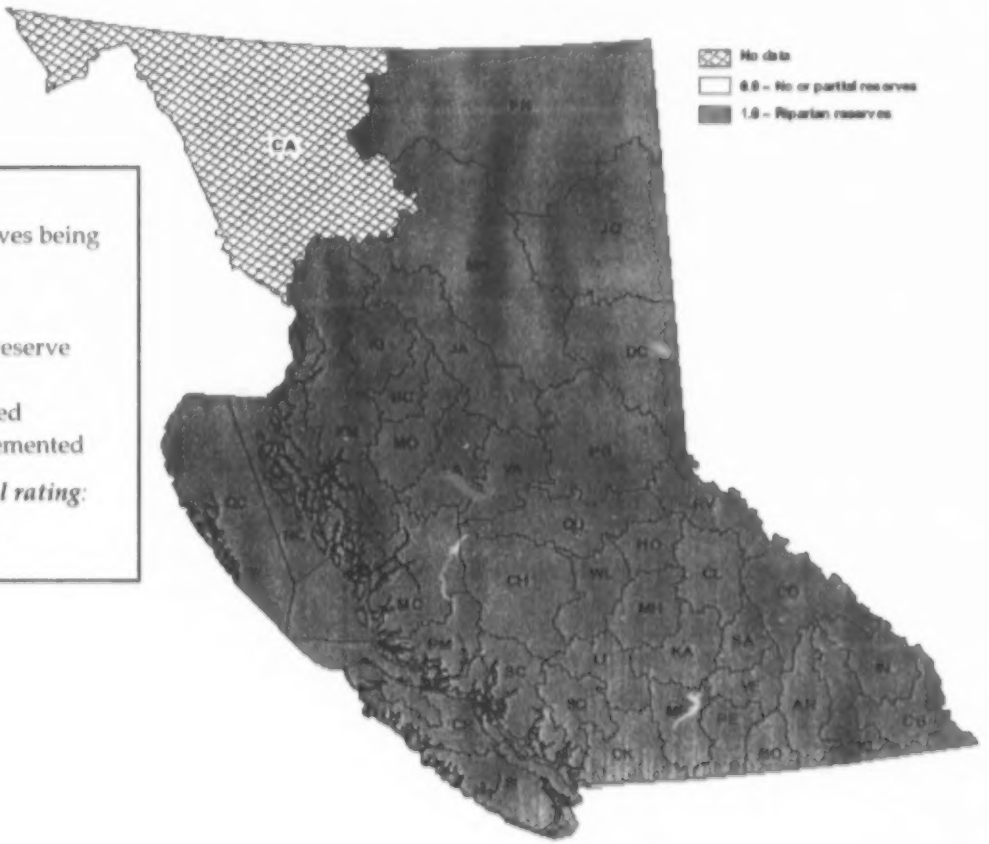
Are riparian reserves being implemented?

Scoring:

- 1.0 – if riparian reserve strategy is implemented
- 0 – if not implemented

***Overall provincial rating*:**

100%



Riparian Reserve Management

Each year the Board conducts audits of licensees and practices in riparian management areas are reviewed. Compliance audits done between 1997 and 2002 revealed very few instances of non-compliance in establishing riparian reserves. While there are examples of stream misclassification, particularly around small fish streams, correct classification may not result in the changes to those areas containing reserves. The reserves required in the Code have been left.

In 2000, MOF and the Ministry of Environment, Lands and Parks (now MWLAP) examined riparian management in the interior, focusing on S4 streams. The survey concluded there were high levels of retention (averaging 25 percent) around the great majority of S4 streams, consistent with guidebook policy.

These results show that the biodiversity strategy for riparian management areas is largely being followed. Districts were also asked whether they had developed district specific policy on retention in riparian management zones. They also estimated the levels of retention for the different stream classes but the information was considered too unreliable to be utilized.

Based on previous Board audits, other government studies and this survey, the Board concludes that there is full implementation of riparian reserves, consistent with the intention of the Code. No cases of non-compliance with this regulation, or of exceptional practices, were noted in the course of the survey.

3.9 Coarse Woody Debris Retained

The *Biodiversity Guidebook* states that maintaining coarse woody debris after harvesting is a critical element of managing for biodiversity. Larger pieces are the most valuable type of coarse woody debris as they provide larger microsites for organisms and persist longer on the ground. Retention of coarse woody debris can, however, conflict with utilization requirements.

Government has set utilization standards to maximize the amount of usable timber coming off a cutblock and to prevent logging debris from impacting the growth of a new stand of trees. The licensee must remove all pieces of trees over a certain size or quality, or be penalized. The standards are policy and, when written into a cutting permit, become a requirement. The *Landscape Unit Planning Guide* states that coarse woody debris should be managed within current utilization standards.

Particularly in times of high pulp markets, low grade wood – classified as "residue" – is harvested and hauled off site. This, as well as conflict with utilization standards, has prevented a strong coarse woody debris policy from being implemented.

The utilization standards ensure that licensees do not waste wood that is large enough to be used. However, in some cases where there is little standing or down deadwood on a site, this can prevent retention of material that is large enough to be effective as habitat and nutrient reservoirs and to remain in place throughout a rotation. Since 2000, the policy has been modified so that licensees can leave larger pieces without being fined. Though biodiversity is mentioned as a purpose for allowing these "waste benchmark" levels, the waiving of waste charges can occur even if the pieces are piled and burned at the landing. Nevertheless, the volume left on site is included in the calculation of the volume used under their licences.

Criteria:

Does the district have a management strategy for coarse woody debris?

Scoring:

- This indicator was not scored because little was reported due to the conflict with utilization standards.

Many districts reported that supply of coarse woody debris is not an issue because much harvesting debris remains on the ground. However, harvesting debris does not generally include pieces of wood large enough to last through a rotation so the debris that is left is a short-term solution.

No district reported a strategy for recruitment of coarse woody debris through time as the new forest is growing to maturity other than from wildlife tree patches, partially cut stands and other reserve areas. Harvesting of the replacement stands will leave much less standing dead or damaged trees as there is much less decay, disease or breakage when harvesting a stand at rotation age than when harvesting a stand that is over-mature. This "sanitization" of managed stands reduces the potential sources for coarse woody debris except in areas of retention such as wildlife tree patches or riparian reserves. The wood that is left on the ground after the initial harvest will decompose in a few decades and will not be replaced unless coarse woody debris recruitment is part of the stand management. Current management strategies may not be effective.

3.10 Ungulate Winter Ranges Established

In BC, winter range habitat that provides foraging areas and/or refuge from deep snow is often critical for survival of ungulates (deer, moose, elk, caribou, mountain goats and mountain sheep). Ungulate winter ranges are not exempt from logging, but are managed to retain mature and old forest habitat for ungulates. Many regions were identifying and managing winter ranges formally or informally before the Code was developed. Initially, the Code did not recognize winter ranges, although there was a potential mechanism to manage them through the establishment of a wildlife habitat area. Ultimately, this mechanism was not available as a list of identified wildlife was required and most ungulates were not included on the list that was eventually established. Management occurred largely through good will or when winter range objectives were included in strategic plans. In 1998, major amendments were made to the Code, which included provisions to establish winter ranges.

With the 1998 amendments, ungulate winter ranges could be grandparented if the winter ranges had been accounted for in the timber supply review process and met mapping criteria. Timber supply impacts could not exceed the level allowed for in the timber supply review. The deadline for grandparenting winter ranges was October 1998. Areas that met the criteria but did not get grandparented in time, and areas that had been accounted for in the timber supply review but not mapped, could still be established.

In 2000, the Ministry of Environment, Lands and Parks (now called Water, Land and Air Protection) and MOF developed a memorandum of understanding providing clearer direction on the criteria for candidate winter ranges and on the process for establishing them. However, this did not cover all ungulate winter ranges. In a memorandum to managers in 2000, the deputy minister of environment and the chief forester stated that the legislation did not limit approval to those winter ranges already accounted for in the timber supply review. Any area necessary for the survival of ungulates was a candidate.

The grandparented winter ranges are referred to as type 1 winter ranges. Winter ranges that have been identified in strategic plans and have already been, or soon will be, accounted for in the timber supply review are referred to as type 2 winter ranges. Type 3 is any new winter range proposals that have not been accounted for in the timber supply review or in a strategic plan. In addition, in cases where the area defined as the non-contributing landbase has changed since the last timber supply review and there are now timber supply impacts that exceed the level established in the timber supply review, the winter range will be addressed as a type 3.

The practical implications of the winter range type are mainly how quickly they will get addressed and also the responsibilities of the three ministries. Type 2 and 3 winter ranges are addressed in a memorandum of understanding released in summer 2003, which clarifies the responsibilities of the ministries and outlines procedures to facilitate the establishment of ungulate winter ranges and the development of objectives.

In fall 2002, the authority for approving ungulate winter ranges was given solely to the deputy minister of MWLAP. However, the responsibility for strategic planning lies with MSRM, so planning type 2 winter ranges requires the involvement of MSRM.

Currently MWLAP is working to establis' 'jectives for all type 1 winter ranges.

Criteria:

The Board asked MWLAP regional managers how the process for establishing ungulate winter ranges was working and if they expected that all important winter ranges would be designated.

Scoring:

- This indicator was not scored because the data was gathered for MWLAP regions and could not readily be broken down by district.

As of March 2004, there are 15 approved ungulate winter range packages totaling 913,462 hectares. Four MWLAP regions had winter ranges established under the Code. The Cariboo and Kootenay regions had winter ranges established with ungulate winter range policy. All regions had additional winter ranges in the planning stages. Five regions expected that all winter ranges that were being managed before the Code came into effect would get established. Two regions had no winter ranges being managed prior to the Code. Only one region reported that the process for establishing winter ranges was working well.

Most commented that the process was slow. A shortage of staff and a lack of cooperation from other government agencies and licensees were obstacles in several regions.

Grandparenting of winter ranges occurred primarily on Vancouver Island. In the Cariboo region, deer and caribou winter ranges had been identified in the CCLUP prior to the Code. Some caribou winter ranges were recognized in the Prince George region. Deer, caribou and moose winter ranges were also identified in the Kamloops LRMP.

Only one example of a significant concern about the ability to manage winter ranges was reported. In the Fraser timber supply area, the area available for management as ungulate winter range has been reduced because of changes in the way ungulate habitat was modelled in the timber supply review process. As a result, it may not be possible to get adequate amounts of ungulate winter range established to manage viable populations within the timber supply area.

Generally, the process for establishing winter ranges, prior to the release of the most recent memorandum of understanding, was reported to be slow and did not have cooperation from all parties.

3.11 Wildlife Habitat Areas Established

The *Identified Wildlife Management Strategy* addresses the habitat needs of animal and plant species that are at risk and impacted by forest and range practices. Volume 1 of identified wildlife was released in 1999, but did not include all of the candidate species at risk. Volume 2 with additional species at risk is scheduled for release in early 2004.

The legal basis for the strategy was the Code regulations. However, none of the regulations apply unless there is a wildlife habitat area established for a particular site. Although the provision to establish wildlife habitat areas has been in the Code from the start, it relies upon there being a list of species designated as identified wildlife. There was a delay from 1995 to 1999 before the list was produced and so the regulation provisions were ineffective until then. Following release of the identified wildlife list, wildlife habitat areas for these species had to be established before the provisions of the regulations would apply. Establishment of a wildlife habitat area is procedurally complex, involving several steps with different committees and consultation with interest groups.

***Criteria*:**

Are WHAs being established?

Scoring:

- This indicator was not scored because the data was gathered for MWLAP regions and not readily be broken down by district.

As of October 2003, there have been 172 wildlife habitat areas established in four years. It took ten months after the strategy came into effect before the first wildlife habitat area was established. Only two areas were established in the first year. The time from initial proposal to the decision to establish ranges from 1 to 45 months. Between regions, the average time varied from 6 to 21 months. The average time does not include areas that were rejected or are still in the proposal stage.

In addition to the 172 wildlife habitat areas that have been established, there are many still being considered. As of October 2003, 195 proposals are awaiting a decision. Of these, at least 119 have been under consideration for 3 to 4 years. MWLAP staff note that the approval time has been decreasing. In addition, over 200 currently proposed WHAs will be approved with the release of Volume 2 of the *Identified Wildlife Management Strategy*.

Table 2: WHA Status October 2003

WLAP region	approved	rejected	waiting decision
Peace	18	0	7
Omineca	18	0	11
Skeena	22	1	26
Cariboo	22	12	16
Kootenay	2	1	7
Okanagan	19	18	41
Thompson	6	3	8
Lower Mainland	41	6	45
Vancouver Island	24	14	34
Total	172	55	195

The Board asked MWLAP staff about the wildlife habitat area process. All regions reported barriers in the process. These generally related to the complex approval process and the low level of staff resources to do the work. A lack of cooperation from other government agencies or licensees was also reported.

Across the province the one percent timber supply impact cap is not limiting the establishment of wildlife habitat areas yet, but a few regions anticipated a problem in the near future. Two regions, Skeena and Vancouver Island, reported that changes were made to wildlife habitat areas to reduce timber supply impacts. On the Queen Charlotte Islands, within the Skeena region, wildlife habitat area proposals appear to have reached the one percent impact ceiling because of the large areas required for the northern goshawk and marbled murrelet. The one percent timber supply cap has been carried forward into FRPA.

Initially, the establishment of wildlife habitat areas was a slow process but this has improved. For some species, such as the marbled murrelet, the delay in establishment of OGMAs has likely affected the processing of wildlife habitat areas. MWLAP staff explained that many of the concerns will be addressed with the release of Volume 2 of the *Identified Wildlife Management Strategy*, which reduces the number of committees and has proposals addressed by only one statutory decision-maker.

4.0 Summary of Findings

Significant findings regarding the implementation of the individual components of the biodiversity strategy are:

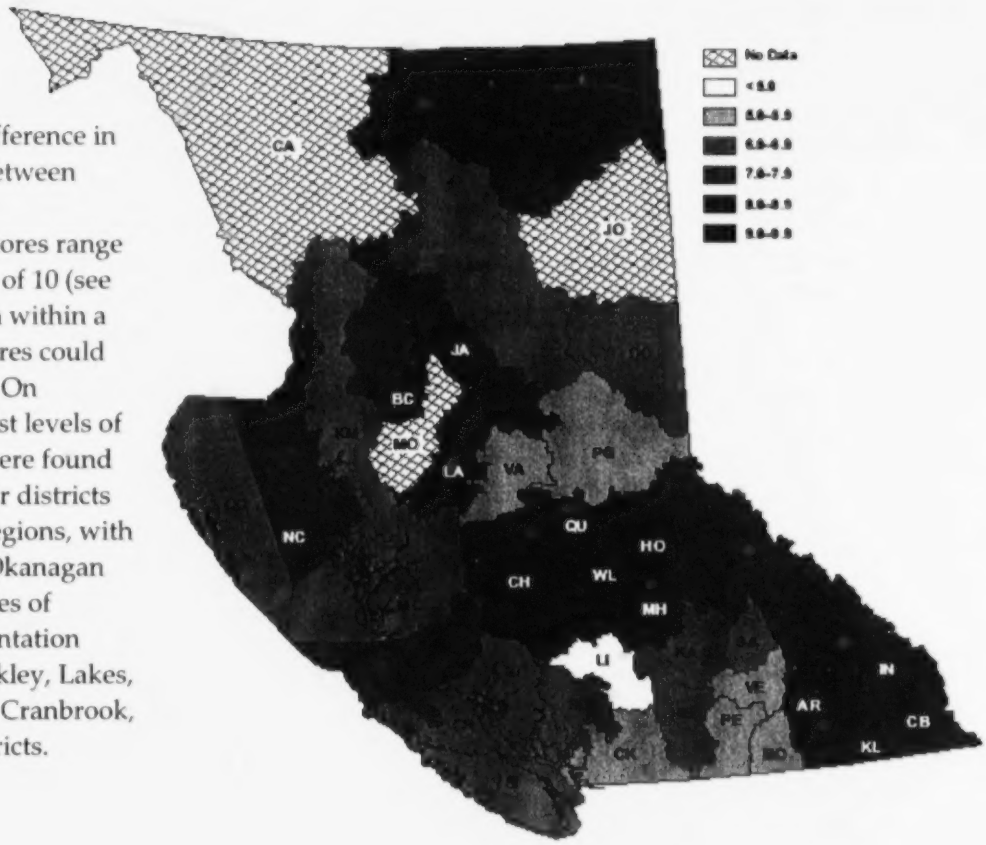
- Draft landscape unit boundaries are defined across the province; however, few landscape units are legally established; only 32 out of the 1200 landscape units were established with legal objectives. An order proposed by government is expected to legally establish the remaining landscape unit boundaries.
- The biodiversity emphasis options were applied as specified in government policy.
- Only 16 districts met the old growth target for all biogeoclimatic (BEC) zones in 75 percent or more of the landscape units. No districts in the south part of the Coast region or Rocky Mountain region met this criterion.
- There is inconsistent interpretation and implementation of patch size recommendations across the province. Less than half of the districts monitor patch size.
- In general, there appears to be little active management for connectivity on the landscape.
- The biodiversity requirements for riparian areas are being followed.
- Generally, the process for establishing ungulate winter ranges was reported to be slow and did not have cooperation from all parties.
- The establishment of wildlife habitat areas has been a slow process but this has improved in the last year.

Using 13 criteria to measure the level of implementation, the Board found that the components in the biodiversity strategy were being applied unevenly. The following table summarizes the provincial rating for the 10 elements that were scored. The score is the sum of the total points scored for that element by all of the districts combined; the maximum possible score is 39. The percentage is simply the score expressed as a percent.

Table 3: Provincial Rating of Elements

Element	Score/39	%
Landscape units defined	39	100
BEO objectives	39	100
Monitor seral stages	18.5	47
Monitor mature and old	23.5	60
Meet old in 75 percent of LUs	18	46
OGMAs defined spatially	21.5	55
Patch size monitored	16.5	42
Wildlife tree patches	39	100
Connectivity	17	44
Riparian reserves	39	100
Overall		**70**

There is a large difference in implementation between districts. District implementation scores range from 4.0 to 9.5 out of 10 (see Appendix 1). Even within a region, district scores could vary significantly. On average, the highest levels of implementation were found in northern interior districts and the Cariboo regions, with the lowest in the Okanagan and coast. Examples of excellent implementation were found in Bulkley, Lakes, Arrow, Kootenay, Cranbrook, and Chilcotin districts.



District Total Scores

Bulkley district, an example of full implementation

The Bulkley district had the highest implementation score (9.5 out of 10). All of the Board's criteria were addressed. The high level of implementation is largely due to the land and resource management plan (LRMP) that was completed for the area. There was strong buy-in from the local resource managers who committed resources to a long-term process. Stakeholder involvement through a community resource board is also a key component of the success of this plan. The completion of landscape unit plans in 1998/99, with measurable targets, was a major factor. These include objectives for early, mature and old seral stages with recruitment objectives for the old seral forest. As well, a connectivity network of core ecosystems and riparian corridors was developed. In contrast, other LRMP initiatives have developed broader level objectives and assumed that the detailed objectives would be addressed in the landscape unit plans which ultimately have been delayed or have only addressed a few objectives such as OGMAs. Finally, the Bulkley LRMP is followed up with an implementation monitoring and reporting program to ensure that targets are being achieved and that the plan remains relevant.

5.0 Major Issues Identified

Through conducting the biodiversity survey across the province, the Board found several corporate-level problems and common themes relating to implementation of the biodiversity strategy:

- **Differing opinions on the approach to implementation and the science behind the strategy.** The original strategy was developed relatively quickly with less information than is available now. In the course of the interviews it became apparent that for some components there are differing opinions and misinterpretations of the intent of the strategy and on how to achieve individual components. There are also differing opinions on the science behind the strategy. For example, a foundation of the *Biodiversity Guidebook* is designing forest management to emulate natural disturbance. This paradigm has its critics who argue that forest management cannot emulate natural disturbances because of other factors such as road construction or the frequency of events. Also, in reviewing conservation strategies, some biologists have concluded that reducing fragmentation of forests and the need for connectivity and old-forest patches are less important than the total amounts of habitat components such as riparian forest or tree cavities.

- **Need for provincial coordination of monitoring for landscape-level components.** The study found that monitoring of seral stage and patch size varied greatly across the province in terms of whether it was done, which agency did it, and the approach used. There should be a coordinated provincial approach to monitoring so that it happens consistently everywhere and managers will have current information to determine where landscape changes threaten the achievement of biodiversity goals.

- **No monitoring of stand-level components.** Wildlife tree management is the most fully implemented element of the biodiversity strategy, but there is no clear program to track and monitor wildlife tree patches. Without this, individual trees or patches could be harvested at a later date, when the intent was to retain them.

- **Delays in completion of biodiversity objectives.** The ability of MSRM to complete planning for biodiversity objectives within a reasonable timeframe is questioned, given existing delays and downsizing. Planning OGMAs is a priority activity but is well behind schedule and most other biodiversity components are generally not going to be addressed in sustainable resource management plans until OGMAs are completed.

- **Confusion about who is responsible for implementation.** For some components of the strategy, it is not clear which agency is responsible for implementation. With the transfer of regional planning responsibilities to MSRM, some staff are unsure which ministry has responsibility for seral stage analysis or patch analysis. This limits peoples' understanding of what information is available and where to get it.

- **Incomplete seral stage management.** There is little direct management for the early and mature seral targets. Seral stage management is restricted largely to OGMA planning and that appears to be a one-off exercise. Once areas are established there is no indication that any further planning or monitoring will occur. There is no planning occurring for recruitment of mature forest into old growth management areas where natural disturbances or stand aging render those areas unsuitable to meet habitat objectives. Sufficient mature forest should be allowed to age to be available to recruit into the old forest category. Current policies may result in a large age gap between the remaining mature forest and the old forest in OGMAs.

- **Minimal management for coarse woody debris.** Up to now there has been no clear policy for coarse woody debris management because of a conflict with the utilization standards. There needs to be a clearer policy on what can and should be left, particularly for the important larger pieces of trees.

- **Lack of planning for landscape connectivity.** There has been a mix of application of connectivity and it is likely best dealt with at the LRMP level through retaining riparian corridors and positioning of OGMAs. However, more could be done through operational planning to achieve connectivity through arrangement of cutblocks over time.

6.0 Conclusions

The Board, through interviews and questionnaires, has surveyed government's progress in planning and implementation of the biodiversity strategy in provincial forests since the Forest Practices Code came into effect in 1995. The effectiveness of the strategy was not evaluated; nor were any area specific initiatives implemented by licensees included in the survey.

Overall provincial success in meeting the individual components of the strategy varied considerably. The highest levels of implementation were achieved in establishing the administrative framework for the biodiversity strategy. Defining landscape unit boundaries and determining biodiversity emphasis areas were completed in every district.

The stand level components—establishment of riparian reserves and wildlife tree patches—were fully implemented across the province. These two components are required by legislation. They are also easy to understand, traditional forestry silviculture prescriptions, carried out at the cutblock level.

Relatively poor implementation has occurred for the most complex components—monitoring seral stages (including mature and old), achieving old growth targets in landscape units, spatially establishing old-growth management areas (OGMAs), monitoring patch sizes, and managing for connectivity. Implementation of these components is directed by policy and is not required by legislation. These components were all implemented in less than half of the districts. A review of the maps suggests the highest level of implementation of these landscape level components appears to occur in those districts with greater supply of mature timber and, accordingly, fewer constraints or timber supply complications posed by implementing the strategy.

7.0 Recommendations

The change from the Code legislation to the *Forest and Range Practices Act* raises a number of questions about the continued implementation of the biodiversity strategy.

A significant amount of effort has been made over the past number of years to get the biodiversity strategy implemented to the current level, but the work has not yet been completed. The Code has now been replaced with the *Forest and Range Practices Act*, but it is not clear what the fate of the biodiversity strategy is under the new legislation. A number of questions arise with respect to the future of the strategy, the requirements of the new legislation with respect to biodiversity, and the government's overall intentions for biodiversity conservation across the province.

The original strategy was developed in a fairly short time with less scientific information than is available now. Resource agency staff have some significant differences of opinion about the strategy, such as whether patch size and connectivity are important components. If the biodiversity strategy is to be continued, it may need to be updated to reflect current knowledge.

The new legislation does not provide clear direction on which components of the biodiversity strategy, if any, still need to be addressed. There is no reference to the *Biodiversity Guidebook* or the *Landscape Unit Planning Guide* in the Act or regulations, so it is not clear if these documents are still intended to provide guidance in meeting government's broad objective for biodiversity established in the new legislation.

The new legislation is also contradictory. Under section 13 of the *Forest and Range Practices Regulation*, licensees do not have to address landscape level biodiversity if the proposed plan is consistent with the maximum cutblock size requirement or the adjacency requirement. If the licensee does not propose cutblocks larger than the default 40 or 60 hectares, they will have met this test. However, proposing only cutblocks below the maximum default size is counter to the landscape level biodiversity objective of ensuring a range of patch sizes similar to the natural disturbance pattern.

In order to evaluate the effectiveness of the new legislation in achieving biodiversity objectives, clear and measurable expectations for results must be identified. Default results are given for the stand level biodiversity components of wildlife tree retention and coarse woody debris. But there is no specific mention of, and no specified results for, patch-size distribution and seral stage distribution.

- RECOMMENDATION 1: **The Ministry of Forests and the Ministry of Water, Land and Air Protection should give clear direction on what the overall strategy for biodiversity is now, and how it applies under the *Forest and Range Practices Act*, making clear where changes have been made to the strategy. Specifically:**
  - **The Ministry of Water, Land and Air Protection should coordinate a review of the biodiversity strategy, including an evaluation of the science behind it, and revise the strategy where necessary.**
  - **The Ministry of Forests and the Ministry of Water, Land and Air Protection should ensure that there are default measurable results for stand and landscape level biodiversity in the Act and regulations.**

Aside from the new legislation, government has indicated that the policy of a one percent cap on timber supply impact for the establishment of wildlife habitat areas is to continue. This one percent cap has been reached, or is close to being reached, in many areas of the province. It is not clear what will happen to conservation of habitat for species at risk after the cap is reached. This is a significant question in light of the federal government's new *Species at Risk Act*.

- RECOMMENDATION 2: **The Ministry of Forests and the Ministry of Water, Land and Air Protection should clarify how proposals for wildlife habitat areas will be considered and prioritized after the one percent policy cap has been reached.**

In addition to measurable results, indicators of effectiveness will also be necessary to enable government and the Forest Practices Board to assess whether or not biodiversity objectives are being achieved.

- RECOMMENDATION 3: **The Ministry of Forests and the Ministry of Water, Land and Air Protection should work together to develop indicators to enable assessment of the effectiveness of measures to conserve biodiversity.**

Regular monitoring of the implementation of biodiversity measures will also be critical to the success of a results-based system. Managers will need current information on the landscape-level components, such as patch size and seral stages, to conduct activities that emulate natural disturbance patterns A GIS-based data management program is needed to track the various components. For example, licensees will be responsible for submitting maps showing wildlife tree patches but there is no program to track and monitor wildlife tree patches across districts or landscape units

- RECOMMENDATION 4: **The Ministry of Sustainable Resource Management should determine the frequency and nature of monitoring required for biodiversity measures, and ensure that monitoring occurs consistently across the province. The ministry should also ensure that there is a program in place to store biodiversity information digitally so that it is readily accessible for managers and auditors.**

The Board requests that the Ministry of Forests, the Ministry of Water, Land and Air Protection and the Ministry of Sustainable Resource Management advise it by June 30, 2004, of the steps taken to implement the above recommendations.

Appendix 1

District Tables

	S. Island	C. River	Pt. McNeil	Sunshine	Squamish	Chilliwack	QC
Landscape Units Defined	1	1	1	1	1	1	1
BEO meet 10/45/45	1	1	1	1	1	1	1
Monitor Seral Stages	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Monitor Mature and/or Old	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Meet Old in 75% of L Units	0	0.5	1	0	0.5	0.5	1
OGMAs-Draft Spatial	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Monitor Patch Size	0	0	1	0	0	0	0
WTP management	1	1	1	1	1	1	1
Manage for Connectivity	0.5	0.5	0.5	1	0	0	0
Riparian Management	1	1	1	1	1	1	1
TOTAL	**6**	**6.5**	**8**	**6.5**	**6**	**5.5**	**6.5**

	Lakes	Bulkley	Kispiox	Kalum	N. Coast	Mid-Coast
Landscape Units Defined	1	1	1	1	1	1
BEO meet 10/45/45	1	1	1	1	1	1
Monitor Seral Stages	1	0.5	0.5	0.5	0.5	0.5
Monitor Mature and/or Old	1	1	0.5	0.5	0.5	0.5
Meet Old in 75% of Units	1	1	1	1	1	1
OGMAs-Draft Spatial	1	1	0	0	0	0
Monitor Patch Size	0.5	1	1	0	1	0
WTP management	1	1	1	1	1	1
Manage for Connectivity	1	1	0.5	0	1	0
Riparian Management	1	1	1	1	1	1
TOTAL	**9.5**	**9.5**	**7.5**	**6**	**8**	**6**

	Lilooet	Merritt	Kamloops	Penticton	Vernon	Salmon Arm	Clearwater
Landscape Units Defined	1	1	1	1	1	1	1
BEO meet 10/45/45	1	1	1	1	1	1	1
Monitor Seral Stages	0	0	0	0	0	0	0
Monitor Mature and/or Old	0	0	0	0	0	0.5	0
Meet Old in 75% of Units	0	1	1	0	0	0.5	0
OGMAs-Draft Spatial	0	0	1	1	1	1	1
Monitor Patch Size	0	0	0	0	0	0	1
WTP management	1	1	1	1	1	1	1
Manage for Connectivity	0	1	0	0	0	0	1
Riparian Management	1	1	1	1	1	1	1
TOTAL	**4**	**6**	**6**	**5**	**5**	**6**	**7**

	Boundary	Arrow	K. Lake	Cranbrook	Invermere	Golden	Revelstoke
Landscape Units Defined	1	1	1	1	1	1	1
BEO meet 10/45/45	1	1	1	1	1	1	0.5
Monitor Seral Stages	0.5	1	1	0.5	0.5	0.5	0.5
Monitor Mature and/or Old	1	1	1	1	1	1	1
Meet Old in 75% of Units	0	0	0	0	0	0	0
OGMAs-Draft Spatial	0	1	1	0.5	0.5	1	1
Monitor Patch Size	0	1	1	1	1	0	0
WTP management	1	1	1	1	1	1	1
Manage for Connectivity	0	1	1	1	1	1	1
Riparian Management	1	1	1	1	1	1	1
TOTAL	**5.5**	**9**	**9**	**8**	**8**	**7.5**	**7**

	100 Mile	Wms Lake	Chilcotin	Horsefly	Quesnel	Ft Nelson
Landscape Units Defined	1	1	1	1	1	1
BEO meet 10/45/45	1	1	1	1	1	1
Monitor Seral Stages	1	1	1	1	1	0.5
Monitor Mature and/or Old	1	1	1	1	1	1
Meet Old in 75% of Units	0	0	1	?	1	1
OGMAs-Draft Spatial	1	1	1	1	0	0
Monitor Patch Size	1	1	1	1	1	1
WTP management	1	1	1	1	1	1
Manage for Connectivity	0	0	0	0	0	0
Riparian Management	1	1	1	1	1	1
TOTAL	**8**	**8**	**9**	**8**	**8**	**7.5**

	P. George	Robson	Vanderhoof	FtSt James	MacKenzie	Dawson Ck
Landscape Units Defined	1	1	1	1	1	1
BEO meet 10/45/45	1	1	1	1	1	1
Monitor Seral Stages	0	0.5	0	0.5	0.5	0.5
Monitor Mature and/or Old	0	0.5	0	1	0.5	0.5
Meet Old in 75% of Units	0	1	0	1	0	1
OGMAs-Draft Spatial	0	1	1	0	0	0
Monitor Patch Size	0	0	0	1	0	0
WTP management	1	1	1	1	1	1
Manage for Connectivity	1	0	0	1	1	0
Riparian Management	1	1	1	1	1	1
TOTAL	**5**	**7**	**5**	**8.5**	**6**	**6**

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